






22102447081

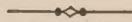


Digitized by the Internet Archive
in 2021 with funding from
Wellcome Library

TRANSACTIONS

OF THE

Odontological Society of Great Britain.



VOL. X.—NEW SERIES.

TRANSACTIONS
OF THE
ODONTOLOGICAL SOCIETY
OF
GREAT BRITAIN.



VOLUME X.—NEW SERIES.

LONDON :

Printed and Published for the Society by
WYMAN & SONS, 74-5, GREAT QUEEN STREET,
LINCOLN'S-INN FIELDS, W.C.

1878.

| | |
|-------------------------------|----------|
| WELLCOME INSTITUTE LIBRARY | |
| Coll. | welMOmec |
| Call | ser |
| No. | WU1 |
| | /0071 |
| | |
| | |

List of Officers.

President.

ALFRED COLEMAN, ESQ.

Vice-Presidents.

RESIDENT.

A. J. WOODHOUSE, ESQ.
HENRY JOHN BARRETT, ESQ.
CHARLES JAMES FOX, ESQ.

NON-RESIDENT.

DANIEL CORBETT, ESQ. (Dub.)
H. CAMPION, ESQ. (Manchester).
DAVID HEPBURN, ESQ. (Edin.)

Treasurer.

JAMES PARKINSON, ESQ.

Librarian.

THOMAS A. ROGERS, ESQ.

Curator.

CHARLES S. TOMES, ESQ.

Honorary Secretaries.

| | |
|--------------------------------|-----------------------------|
| OAKLEY COLES, ESQ. (Council) | FOR FOREIGN CORRESPONDENCE. |
| A. WM. BARRETT, ESQ. (Society) | W. G. RANGER, ESQ. |

Councillors.

RESIDENT.

E. B. RANDELL, ESQ.
F. G. BRIDGMAN, ESQ.
F. WEISS, ESQ.
H. B. LONGHURST, ESQ.
H. SEWILL, ESQ.
J. S. TURNER, ESQ.
T. UNDERWOOD, ESQ.
E. B. WEST, ESQ.
A. P. REBOUL, ESQ.

NON-RESIDENT.

S. AMOS KIRBY, ESQ. (Bedford).
J. DENNANT, ESQ. (Brighton).
W. MARGETSON ESQ. (Dewsbury).
W. CAMPBELL, ESQ. (Dundee).
J. DOHERTY, ESQ. (Dublin).
W. R. WOOD, ESQ. (Brighton).

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The following applications for Membership have been received by the Council :—

Mr. MARK J. BLOOM, 23, Westland-row, Dublin, Non-resident.

Mr. GEORGE BRUNTON, Leeds, Non-resident.

Mr. HENRY AUGUSTUS KING, Bedford Circus, Exeter, Non-resident.

Mr. CHARLES NORMAN KING, 7, Bedford Circus, Exeter, Non-resident.

Mr. THOMAS MURPHY, Moss House, Bolton, Lancashire, Non-resident.

Mr. THOMAS F. PEDLEY, 9, The Terrace, Camberwell, S.E., M.R.C.S., L.S.A., L.D.S. Resident.

Mr. WILLIAM LLOYD POUNDALL, 5, Lansdowne Terrace, East, Brighton, L.D.S., R.C.S., Non-resident.

Mr. J. T. WHATFORD, 79, Grand Parade, Brighton, Non-resident.

Mr. JAMES COWAN WOODBURN, 275, Sauchiehall-street, Glasgow, M.D., L.F.P.S.G., Non-resident.

Mr. ARTHUR GRENVILLE LEVASON, 12, Bridge-street, Hereford, Non-resident.

Mr. CLAUDE ROGERS, M.R.C.S., L.D.S., D.M.D., (Harvard), 2, Cork-street, W., Resident.

The following gentlemen having signed the obligation book, were admitted Members of the Society :—

Mr. W. TAYLOR SMITH.

Mr. H. A. BEVERS.

Mr. JAMES J. SIMMONDS.

Mr. E. R. KEELING, Junr.

The PRESIDENT announced the following Contributions to the Library :—

Francis Mason, on "Hare-lip and Cleft Palate" ; presented by the Author.

Magitot, "Traite des Anomalies du Système Dentaire ;" presented by the Author.

"Transactions of the American Medical Association during the year 1876."

Vol. of Prize Essays, from the same Society.

The SECRETARY then read a communication from Mr. Crapper, of Hanley, on "Continuous Gum Work."

Invented about twenty-five years ago, by Dr. John Allen, this system of work has always found more favour in America than in this country.

The objections which have been brought against it are—first, its weight, and secondly, the time and trouble necessary to effect repairs in case of breakage.

The first objection Mr. Crapper does not allow to be real ; although the work is heavy, patients do not feel the weight, and he states that he has never heard a patient complain of it, even though the set had been substituted for one of vulcanite or celluloid. The plate is kept in position by atmospheric pressure—fourteen pounds to the square inch—and if it fit accurately the pressure is so evenly distributed that the patient

does not experience the slightest feeling of traction on the gums. With reference to the formation of suction cavities in plates, Mr. Crapper thinks that those having sharply-defined edges are objectionable, and that graduated suction cavities are the best, being just sufficient to prevent the plate from pressing upon the hardest portion of the palate.

The second objection is more real, and it is advisable to impress upon patients the necessity of taking great care of their teeth when out of the mouth. It is a good plan to keep a small wooden bowl to wash them in, as they may be injured by being dropped into an ordinary wash-hand basin. Mr. Crapper thinks, however, that this objection does not counterbalance the advantages conferred upon the patient both as regards comfort and natural appearance. One often meets with cases of prominent alveoli and short upper lip, the gum showing very high ; in such cases the artificial gum can be worked to a thinness unattainable by other methods, and a more natural appearance can thus be obtained. Mr. Crapper could speak from personal experience, as he had worn for some time past an upper denture made on this principle, and could testify to having derived more comfort from it, combined with other advantages, than he had previously experienced from other appliances.

As the plate is retained in the mouth by atmospheric pressure, a considerable amount of care and attention to detail is required in the making ; it must be a perfect fit, else it will be useless. The first step is to take an impression of the mouth in plaster of Paris. Pure soft platinum should be employed as a base, without it the porcelain would be too soft for ordinary work. After swaging the plate, and finishing to the desired form, pure soft platinum wire of a conical shape should be soldered with pure gold round the edges ; the plate should then be "roughed" by a sharp sculptor, after the style of chasing or frosted work, so as to cause the body to be retained on its surface when fired. The bite having been accurately ascertained, and suitable teeth selected, they should be ground and adapted after the usual manner. The piece

may now be tried in the mouth and correctly articulated ; “ having satisfied yourself that it fits properly, insert the teeth in a casing of plaster of Paris, asbestos, and silver sand.” This should be slowly dried, and the retaining wax removed by a stream of boiling water. Strips of soft platinum should then be passed under the pins of the teeth, closing them securely over the strips. Pure gold only should be used for the soldering ; this should be cut into small portions and placed *in situ*, so that when subjected to the heat of the furnace the gold will readily secure the pins and strips to the plate. “ Allow the piece to cool gradually ; let it be carefully washed and well dried, then with a suitable spatula apply the silicious body carefully, with the judgment which can be acquired only by practice and with a cleanliness which is indispensable.” Usually after the first firing cracks and flaws will be found, these should be carefully filled up with new material, and the piece fired again ; this must be repeated until an even, smooth surface is obtained. The enamel should then be applied in the same manner as the body. Repeated firings, either in the first making or for repairs, do not injure the plate or teeth provided proper care be taken to heat and cool the piece *gradually*. Before effecting repairs the pieces should be boiled first in dilute sulphuric acid, and subsequently in a saturated solution of subcarbonate of soda, in order to remove all traces of the buccal secretions. To give a neater finish, the continuous gum set is plated with fine gold by means of the gilding solution.

With reference to the Cheoplastic process, specimens of which were exhibited by Mr. Crapper, he remarked that it was most suitable for lower cases ; and when great absorption of the alveoli had occurred, the gums presenting an almost flat surface, he found that when relief was subsequently required by the rounding of the outer edges, the necessary filing could generally be done without interfering with the original finish. When continuous gum work is adopted for lower pieces a well-defined prominent ridge of the gum is necessary ; but in cases when additional weight may be advantageous, the

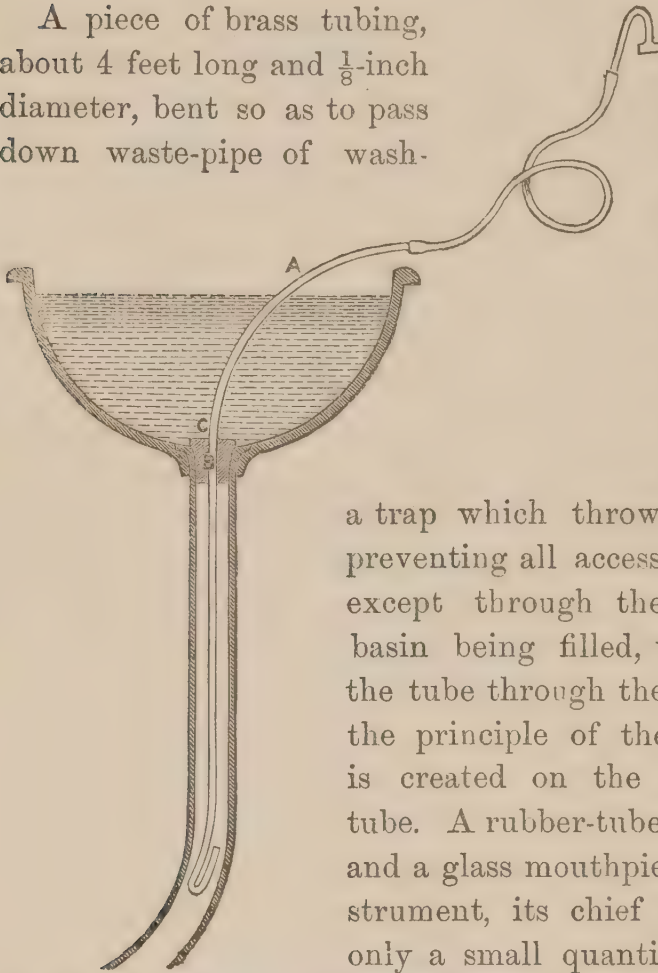
Cheoplastic lower gives increased steadiness and deadness of fit. For a detailed explanation of this process he referred those interested to the account given in Dr. Harris's work on the "Principles and Practice of Dentistry."

Mr. CRAPPER added, that some of the specimens exhibited had been made with bodies and enamels of his own composition, which fused at a lower temperature than did those used by Dr. Allen. He had recently been experimenting with the view of substituting a gas furnace for the ordinary coke fire, but, although he had met with a certain amount of success, his results as yet had not been sufficiently satisfactory to justify him in bringing them before the Society.

The PRESIDENT thanked Mr. Crapper for his very practical paper: he had not much experience of the system himself, but he thought the Society was indebted to Mr. Crapper for calling its attention to a method which was not much practised in this country, but which, in some hands at least, appeared to give very satisfactory results.

Description of Saliva Pump, shown by Mr. CLAUDE ROGERS, at the November Meeting of the Odontological Society, 1877.

A piece of brass tubing, about 4 feet long and $\frac{1}{8}$ -inch diameter, bent so as to pass down waste-pipe of wash-



basin, with cork attached at B, which fits into opening of waste-pipe so as to stop all egress of water from basin except through small pin-hole at c. The lower end of the tube is turned upon itself, forming

a trap which throws the water back, preventing all access of air to the tube except through the upper end. The basin being filled, water passes down the tube through the pin-hole at c; on the principle of the syphon, a draught is created on the upper end of the tube. A rubber-tube of sufficient length and a glass mouthpiece complete the instrument, its chief points being—that only a small quantity of water is re-

quired to work it (about $1\frac{1}{2}$ to 2 gallons an hour), simplicity,—and cheapness.

The amount of suction created is enough to draw up pure glycerine, which serves as a fair substitute for viscid saliva.

Mr. COLEMAN said that his colleague Mr. Ewbank had lately been using Mr. Rogers's invention, and had been much pleased with its simplicity and efficient action.

Mr. CHARLES TOMES said that after seeing Mr. Rogers's invention, he had a modification of it fitted up in his own operating-room. Instead of placing one end of the tube in the

waste-pipe, he had it carried down the leg of the chair and through the floor; here it was joined by a horizontal tube communicating with a cistern, the aperture between the tubes being very small. Beyond the point of junction the vertical tube was carried downwards, and opened externally. Turning on the water from the cistern at once set the pump in action; the apparatus was thus almost automatic, and the basin left free for its legitimate uses. He found that a consumption of three quarts of water per hour sufficed to keep the pump in full work.

Mr. TOMES then proceeded to exhibit a specimen which had been sent to him for examination by Dr. Barrett of Buffalo, U.S.A. It was a lobulated calcified tumour, of ovoid shape, measuring about $\frac{5}{8}$ of an inch in length by $\frac{3}{8}$ in width, attached to the roots of a lower molar tooth. It partly surrounded the apices of both the roots, but microscopical examination showed clearly that the growth was invading the tooth, and did not spring from it or from any portion of its formative pulp. Mr. Tomes believed the specimen to be unique; certainly it was quite unlike any he had hitherto seen figured or described. As to its nature he was not certain; it might be a calcified enchondroma, or it might be an odontome springing from the germ of another tooth; no dentine was, however, discoverable in any part, so far as he had yet examined. Unfortunately, Dr. Barrett had not yet been able to obtain any history of the case, though he still hoped to do so.

Mr. TOMES also exhibited an elephant's tusk, the growth of which had been curiously perverted; it was studded with irregular masses of secondary dentine.

Mr. MOORE, of Croydon, then related the following case. A lady called upon him in June last with her son, a boy about eleven years old. The latter complained of a tumour in the mouth, which, on examination, proved to be a dentigerous cyst; it appeared to be connected with a deciduous molar. Mr. Moore extracted this, the cyst was opened, and some glairy fluid escaped. After mopping it out with dilute carbolic

acid, the crown of the second bicuspid could be seen just appearing at the bottom of the cavity. The adjacent permanent molar was carious, but Mr. Moore did not think it necessary to interfere with it just then, so he told the boy to come again in a month's time. But when he presented himself in July no diminution had taken place in the size of the tumour, and the growth of the bicuspid had not advanced; in August the state of things was the same. Mr. Moore now extracted the carious molar, and found its periosteum thickened and congested. In September the tumour had begun to decrease in size; in October the diminution was considerable, and when the boy was last seen, a few days before the meeting, it had almost disappeared. Mr. Moore thought that the case was interesting, as confirming the account which Mr. Tomes gave of the pathology of dentigerous cysts, viz., that they were due to excessive secretion of fluid in the sac which protects the crown of the growing permanent tooth, and he thought that in this case the excessive secretion was probably caused by irritation set up by the inflamed and carious molar which he had extracted in August.

Mr. HOWARTH then exhibited a new lathe head.

Mr. PEDLEY exhibited his apparatus for the administration of gas and ether, and explained its action. Its most noticeable feature was an ingeniously-constructed tap placed between the face-piece and the reservoirs; on this was stamped "air," "gas," "gas and ether," and "ether and air," and by setting the button of the tap opposite any one of these marks the patient could be made to inhale that which was indicated on it. The apparatus, which was very portable, was thus equally useful for long or for short operations.

The PRESIDENT then called upon Mr. S. Hutchinson to read his paper on "The Radical Cure of Alveolar Abscess."

The Radical Cure of Alveolar Abscess. By
S. J. HUTCHINSON, M.R.C.S., &c.

MR. PRESIDENT AND GENTLEMEN,

I CANNOT enter upon the subject of my paper, without a few words of explanation as to how so familiar a topic has been chosen. At an early meeting of last Session, March or April, it was decided to have an evening set apart for discussion, without a formal paper, and I was asked by the officers just to start the above subject. However, the supply of papers was so full that no opportunity for such a discussion offered itself, and I willingly held myself ready for any time when a blank should occur.

As I have already said, by the activity of our officers no such blank occurred, and at the last meeting of the Society it was decided that at the November meeting I should read a short paper on "The Radical Cure of Alveolar Abscess."

Constantly before my mind has been the fact that the paper was to be read to a society of practitioners well skilled in their art, and not to mere tyros, and that, therefore, copious extracts

on the pathology of alveolar abscess would be out of place. I have, therefore, confined myself to acknowledging most of the sources from which the following notes are taken, and giving also a few cases, illustrative of a plan which seems to give the keynote to a greater success in its treatment.

I will quote from Taft's "Operative Dentistry," 3rd Edit., just published, wherein he admits: "In regard to the treatment of alveolar abscess much remains to be learned. With the attainments thus far made in this direction no aspiring dentist will rest satisfied, though in the hands of a few it has made great progress within a very recent period." This book has only been published a few months, and is the most recent authority, yet the following plan is not alluded to, although in the November number of the *Cosmos*, 1876, Dr. Farrar gave some of its details.

Last session two-thirds of the papers were about the complications of the nerve-pulp, alive and dead, and since April there has been time to collect cases, with which I trust we may be favoured. Our President in February, as also Mr. Barrett, in December, 1875, said that "he hoped a categorical list of cases would settle the matter finally." I, unaided, cannot hope to do this, but wish Mr. Barrett's idea may be realized. Mr. Coleman, Mr. Ashley Barrett, Dr.

Walker, and Mr. Spence Bate all alluded to the cure of alveolar abscess in their papers, and spoke of creosote, arsenic, and carbolic acid as the agents; and Mr. Underwood, Dr. Field, and Mr. Stocken each described their methods, using creosote, salicylic, and carbolic acids.

In looking over the old Transactions, in 1861 I find our President wrote a paper on fang-filling, before the discovery of carbolic acid, and alcohol was the purifying agent, with creosote. In May, 1865, Mr. Woodhouse introduced the subject of carbolic acid as a dressing for exposed nerves, and predicted the usefulness it has since attained; and in November, 1865, Mr. Thomas Rogers's paper was on fang-filling, and he used creosote and iodine as a dressing, saying he often found abscesses disappear, he did not know how or why. Mr. James Bate, in February, 1867, had a paper on the carbolic treatment.

The most obvious and the most successful cure of alveolar abscess is the extraction of the offending tooth, but such a course is radical indeed, and we must, if possible, inaugurate a "conservative-radical" treatment, but the cases must be chosen judiciously for the teeth to be "preserved usefully."

The upper incisors and bicuspid and the lower temporary molars are those which have been most successfully treated by me, and I will later

give the cases, and the time they were under treatment.

The term “preserved usefully” is used advisedly, because a tooth kept in the head on which the patient cannot eat, is worse than to extract it, for the obvious reason that it cripples the whole side it belongs to. The lesser evil of a tooth sensitive to heat and cold is more to be condoned, as this symptom is wont to disappear; but, personally, I must confess I have worn out my patients’ endurance, and my own, in the endeavour to render hopeless teeth helpful, and I am almost losing heart at the uphill work it is.

Although the means I shall shortly detail have proved helpful in many cases, yet the failures are numerous, and I think a broad line of distinction may be drawn, dividing two classes,—1st. Where a fistulous opening or chronic “gum-boil” is present. 2nd. Where this does not exist, but there are symptoms of periostitis and latent alveolar abscess.

These two classes each contain all the successes and failures—the successful cases where a “gum-boil” exists, the unsuccessful ones where the disease has not progressed so far. And to the former division I would chiefly devote my paper, seeing that my hitherto experience has been favourable; and on the other division I would crave the members present to freely debate, as there is much to learn on this point.

This part of the paper will not contain any original matter, as it must be admitted the plan adopted has been published before, and, indeed, referred to in this room, but the manner of applying the dressing is a little different, and, I believe, more advantageous.

To take a typical case—say a central incisor, of which the pulp has come to grief from the application of an osteo-stopping, the most common cause—and it will be found that the cervical edge of the stopping has wasted away, and the pulp is dead and decomposed, with a small chronic abscess over the apex of the fang. Here we have a most favourable specimen to treat, provided excavation of the caries and the stopping leaves the tooth a good colour.

Having removed every particle of pulp-remains from the fang as far as is possible without going through the apex of the fang, a light dressing of aconite and chloroform should be applied up the root. This dressing of aconite and chloroform is well worthy of note as an application when the pulp cavities have been cleaned out, but all periostitis not subsided, for it acts then like a charm in removing the tenderness of a tooth in its socket.

A chief point to observe in order to gain success, is to be more than careful of the perfect cleanliness of the barbs and broaches used in clearing out the fang. This seems a small matter,

but too much care cannot be used, when one remembers that Professor Lister, at King's College, said, "that a needle-point dipped in a very weak solution of decomposed blood and water, and then that needle-point only allowed to touch the edge of a pure vessel of blood, would develop in it crowds of bacteria !

On the next day but one the treatment may commence (after putting on the rubber-dam) by the application of pure crystals of carbolic acid, Calvert's No. 1, into the pulp cavity, and here is the point I desire to be noted—that no water or glycerine should be added as a solvent of the acid, the heat of the tooth in a few seconds being sufficient to melt the crystals, and to insure the absence of germs by any diluent. The crystals are most easily applied on a fragment of amadou to which they cling, and do not drop about the mouth.

A piece of wool should be wrapped round a flexible broach, so as to form a sort of piston-rod the size of the pulp cavity, and being saturated with carbolic acid it will not absorb that already in the tooth, but if the piston be worked up and down will force the acid well up the tooth, and possibly through the apex of the fang, so as to appear on the surface of the gum through the fistulous opening—this I have been able to do on a few occasions in the most successful cases.

When this has been thoroughly performed the cavity may be syringed out with warm water, and the same process repeated. The tooth may now be considered ready for filling, and during the preparations the whole cavity should contain pure carbolic acid on wool in excess, and it is well to keep the rubber-dam on all the time, as it keeps the acid in due bounds. A fresh minute piece of cotton is taken soaked in the pure acid, having also ready several broaches with clean wool on them to dry out the chamber, then with a fine instrument pass up the carbolized wool to the apex of the fang, and next an equally small piece of wool immersed in a very liquid mixture of osteo, as thin as cream, and the wool loosely wrapped, so as to be imbued with the fluid; this next goes up the fang as quickly as possible, the object being to seal up an atmosphere which shall be antiseptic. The remainder of the fang can now be filled with fluid osteo, with filaments of wool in it to ensure its being well carried up the root.

The cavity of decay, when the osteo is hard, may be filled with gutta-percha stopping, as being the most easily applied and easily removed in case of bad consequences.

It is maintained that by having all particles of pulp, by any chance not removed, thoroughly saturated in carbolic acid, and then sealed up

hermetically in that condition, there is less likelihood of a bad result from any access of atmospheric air, the germs of which should cause putrescence. There is thus inaugurated what has been justly termed "conservative antiseptic dentistry," and the conditions here exist for the perfect hindrance of decay, and I may be pardoned if I wander from the point to remark, that the great desideratum (yet, alas ! undiscovered) is a stopping of the nature of osteo which shall be applied similarly, but which shall not wear away under mastication, for it would fulfil every requirement of the patient, and most certainly prevent the spread of caries, besides removing all fear of electro-chemical action from the mixture of gold and amalgam fillings.

And I must further crave your pardon, when I say that if a reliable stopping can be put in a tooth in half-an-hour, it is not to the patient's interest to spend two over it.

Papers have been read before this Society on the various phases of alveolar abscess, but the text books do not give this particular method of treatment.

Mr. Coleman has tried the removal of the tooth, excision of the abscess, and replantation. I hope we shall hear of his success. Mr. Spence Bate recommends glycerine applied like carbolic acid ; and Dr. Farrar, in the paper in *Cosmos*,

November 1876, uses a special syringe adapted by himself, which ejects creosote or aromatic sulphuric acid down the fangs or into the fistula. Taft proposes the somewhat heroic treatment of trephining the bone over the apex of the diseased fang, and excising the abscess.

Others, again, practise a method of establishing a more perfect sinus by means of a seton or plug, so as to allow the abscess to heal out from the bottom.

So far the treatment has depended on a condition of chronic abscess opening on the gum surface; but before this stage is reached, it is necessary to have some means at command to save the tooth, and instead of using carbolic acid, I recommend creosote and morphia mixed into a strong paste, for the heat of the tooth liquefies this sufficiently to let it go well up the fangs; and a wonderfully soothing effect it seems to have—the creosote is antiseptic and the morphia anodyne; by this treatment a tender tooth, raised in its socket, may, by a few weeks' careful dressing with creosote and morphia, be made ready to stop with every chance of success.

Mr. Coleman, at one meeting, spoke of the use of arsenic as a permanent dressing at the bottom of large and old cavities in refilled teeth; it would be interesting to know whether he still finds this application successful.

With regard to cases I find most amenable to treatment, I can quote several of upper incisors and bicuspid; but except in the case of children, I do not find the molars particularly subservient to treatment.

CASE I. —Miss M. Left upper lateral dark in colour; pulp dead; chronic abscess; gold stopping. Removed stopping; cleaned out fang; applied pure carbolic on wool without attempting to force it through the apex of fang on first day. In two days changed dressing and put on rubber-dam, which, by the way, should always be applied; filled the pulp-cavity with crystals of pure carbolic acid, saturated also a plug of wool which would just fill cavity like a piston-rod; pumped it up and down, and was able to see the gum blanch at the fistulous opening, showing that the acid had worked right through. I now put a fresh piece of wool soaked in carbolic, about the size of millet seed, at the extreme apex of fang, to prevent air being forced through the fang; then, mixing some osteo very thin and involving in it shreds of wool, I proceeded to fill the fang perfectly air-tight and antiseptic, nearly to the pulp-chamber; this I filled with Hill's stopping, and at the end of a week removed this and put in gold, the tooth having much improved in colour and appearance, and the fistula quite disappeared.

CASE II.—Mrs. T. Right upper first bicuspid, with chronic sinus. Here, on cleaning out remains of pulp, it was followed by inflammation of periosteum and swelling of cheek and eyelids ; but patient was determined to persevere, so after a longer period of dressing (about a fortnight) with carbolic acid, the tooth became ready for filling exactly as described, only the gutta-percha has not yet been replaced by a harder material.

CASE III.—Master H. R. Acute abscess at roots of first temporary molars ; age five years ; parents and myself very anxious to keep them their due time.

The abscess pointed over the roots and discharged freely, and by clearing out the remains of the pulp and dressing with carbolic acid, which in this case came out through fistula, I was in a fortnight able to fill them both, and six months afterwards they were quite healthy and firm in their sockets.

I think I have here given sufficient evidence of the success of this method, though my case-book contains others, and in my hands, at least, the pure carbolic acid treatment with perfectly air-tight and antiseptic stopping, seems best adapted for the radical cure of alveolar abscess.

DISCUSSION.

The PRESIDENT remarked that the subject was a most important and interesting one ; all present must have had ample experience of the troublesome nature of the complaint ; it must be allowed that the methods of treatment at present in use were not altogether satisfactory, and if the discussion should add to their resources in this respect, the evening would not have been spent in vain.

Mr. VANDERPANT said that his experience of arsenic had not been satisfactory. He had lately stopped a tooth after devitalizing the pulp with arsenic ; the pain soon returned, and on removing the filling he found that hæmorrhage had occurred into the pulp cavity. He then used Mr. Oakley Coles's pepsine ; a week afterwards he found that the pulp had disappeared, and he was able to stop the tooth successfully with Ash's composition.

With regard to Mr. Hutchinson's treatment, there was one fact which he thought that gentleman had overlooked, and which would very materially interfere with the success of his method in some cases, viz., the fact that an alveolar abscess was not always found at the apex of the fang, but might form in other situations. He had had evidence of this on his own person, for after having had a very troublesome tooth extracted, the abscess was found to be at the point of bifurcation of the roots. Had Mr. Hutchinson any means of diagnosing the seat of the abscess ?

Mr. COLEMAN said that he had never asserted that arsenic was a certain cure for alveolar abscess ; still, he had found it useful in cases when the periostitis was not very acute. He applied the arsenic under a temporary filling, and he found

that with this treatment the inflammation often subsided, and that he was able eventually to stop the tooth satisfactorily. It should be remembered that arsenic was a powerful antiseptic, and when they considered what a very small quantity was required to produce the good effects he had spoken of, he thought that these results were probably due to its power of arresting putrefaction rather than to any "devitalizing" action. Indeed, Mr. C. S. Tomes had suggested that the arsenic might under the circumstances enter into combination with the albumen of the pulp and thus form a compound which would prove to be innocuous, and he quite agreed with Mr. Tomes. As to re-plantation, he had only had recourse to this operation in cases where no other treatment was possible except extraction. Fifty per cent. of the teeth thus treated had been saved, and, when it was remembered that but for this treatment every one of them was doomed to be lost, he thought that the results were not unsatisfactory.

Dr. FIELD said he was very glad to hear that Mr. Hutchinson had been successful in his treatment of the deciduous teeth; he thought that sufficient attention was not generally given to the preservation of those teeth. The result of allowing them to get into a bad state was that the child was unable to masticate its food properly, its digestion became impaired, and as a consequence the health suffered and serious damage might be done to the child's constitution.

He had seen a good many cases of replantation in the practice of Mr. Byng, of Paris, but had not seen one which he could call really successful—not one case in which the patient could boast of a really useful tooth as the result of all the pain and inconvenience he had gone through.

His own plan was to lance deeply, opening up the abscess, and then to use Coxeter's aspirator. He thought that with care and early treatment nine-tenths of the cases of alveolar abscess could be cured; it might be necessary in some cases to keep the patient under treatment for twelve months before a satisfactory result was arrived at, and some, he was bound to

confess, baffled all treatment. Patients of strumous habit were especially bad subjects for successful treatment.

Mr. STOCKEN said he quite agreed with Dr. Field that the constitution of the patient was an important element in considering the prospects of the successful treatment of any given case. He should be glad if Mr. Hutchinson would give some further details respecting the treatment by aromatic sulphuric acid, which he had mentioned ; was it used strong or diluted ?

Mr. CHARLES TOMES remarked that it should not be forgotten that in treating a case of alveolar abscess we might not be dealing simply with inflammation of the soft parts. On careful examination of the affected tooth small exostoses and marks of absorption would be found on the fangs in most cases, unless, indeed, the mischief was very recent. It was, perhaps, not quite certain whether these changes were invariably present in cases of periostitis, and if, as was generally supposed, they were the result of the inflammation, we had yet to learn how far their presence might oppose an insuperable obstacle in the way of successful treatment.

Mr. MOORE, of Plymouth, said that he had succeeded in finding exostoses on the fangs of almost every tooth which he had extracted on account of alveolar abscess. His usual treatment was to puncture the alveolus near the apex of the tooth.

Mr. HUTCHINSON, having been called upon by the President to reply, said that in the first place he wished to negative the idea that he had brought forward his plan because he had met with an unusual amount of success ; he had met with a certain amount, but had also met with many failures, and had not, therefore, been as successful as he could have wished to be. His object in reading the paper had been rather to start a discussion in the hope of learning from the practice and experience of others quite as much as he had gained from his own. In answer to the query which had been put to him by Mr.

Stocken, he could only refer that gentleman to the article in the *Cosmos*, from which he had quoted—he had no experience of the treatment himself. In the absence of a fistula he did not pretend to be able to diagnose the seat of an abscess.

After the usual vote of thanks the President announced that at the next meeting a paper would be read by Mr. ASHLEY BARRETT, on the “Symmetrical Extraction of Teeth,” and the meeting terminated.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.



The following applications for Membership have been received by the Council :—

GEORGE AUGUSTUS COURTENAY BENHAM, 155, Woodhouse-lane, Leeds, Yorkshire, Non-resident.

CHARLES SIBTHORPE BRIGHT, L.D.S., R.C.S., 14, Via Assalotti, Genoa, Italy, Non-resident.

JOHN LAWS, 125, St. George's-road, Bolton, Non-resident.

GENERAL MONTHLY MEETING,

December 3rd, 1877.

SAMUEL CARTWRIGHT, ESQ., PRESIDENT, IN THE
CHAIR.

THE Minutes of the previous Meeting were read and confirmed.

The following gentlemen were nominated for Membership :—

Mr. MARK J. BLOOM, 23, Westland-row, Dublin, Non-resident.

Mr. GEORGE BRUNTON, Leeds, Non-resident.

Mr. HENRY AUGUSTUS KING, Bedford Circus, Exeter, Non-resident.

Mr. CHARLES NORMAN KING, 7, Bedford Circus, Exeter, Non-resident.

Mr. THOMAS MURPHY, Moss House, Bolton, Lancashire, Non-resident.

Mr. THOMAS F. PEDLEY, 9, The Terrace, Camberwell, M.R.C.S., L.S.A., L.D.S. Resident.

Mr. WILLIAM LLOYD POUNDALL, 5, Lansdowne Terrace East, Brighton, L.D.S., R.C.S., Non-resident.

Mr. JAMES COWAN WOODBURN, 275, Sauchiehall-street, Glasgow, M.D., L.F.P.S.G., Non-resident.

Mr. CLAUDE ROGERS having signed the obligation book of the Society, was admitted a Member.

The PRESIDENT announced that Mr. Mummery had presented to the Society the skeleton of an elephant's head.

The President then called upon Mr. Mummery to read a communication from Mr. Dunn, of Florence, respecting Dr. Slayton's new metallic stopping.

Mr. MUMMERY then rose, and said, A few months ago—writes Mr. Dunn—Dr. Slayton, an American gentleman, who has practised for many years in this city, presented me with a sample of a preparation of his invention, of a metal, or a combination of metals, for filling teeth, which he requested me to try, and which he said possesses these valuable qualities :—

1. It does not discolour the tooth filled with it.
2. It does not itself discolour with time, in the mouth.
3. It is not affected by the fluids of the mouth.
4. It welds thoroughly well even when wet with saliva.
5. It contains no objectionable ingredient.
6. It is easy to work.

I lost no time in trying it in the mouth, and found that it appeared to possess all the qualities Dr. Slayton claimed for it.

One of the cases which I tried six months ago, the crown of an upper wisdom tooth, a very large filling, I have seen within the last few days. Its colour and appearance, in every respect, are satisfactory.

Since that time I have applied it in forty-six cases. I have not seen all of these since, but some of them I have been able to see again, and all are satisfactory.

In the filling of deciduous teeth I have found it extremely useful. In these cases I find it often so difficult to keep the cavity dry during the whole operation, that a metal which welds and consolidates well under moisture, which is easily applied, and which does not require very severe pressure to become solid, is, I think, inestimable.

In difficult lateral cavities, from its fibrous nature, it offers great ease ; it clings together, and is so soft in working, that it is almost as easy to apply as an ordinary amalgam, while by consolidating and malleting, it becomes a good solid mass.

Gold can be welded on to it (when dry), so that a cavity (should an operator desire to do so) could be filled, first, partly with this metal, and finished superficially with gold : the gold

adheres perfectly to it and is not affected by it. Dr. Slayton says that as this metal is pre-eminently a non-conductor, this might be desirable in cases of sensitive teeth.

In the early part of October in this year, at the meeting of the first Congress of Dentists in Italy, held in Florence, Dr. Slayton showed this preparation, and in presence of the members filled a cavity in the mouth with it. He also gave a sample of the metal to several dentists there and begged them to try it.

Having seen such apparently good results from it, I suggested to Dr. Slayton that it would be well for the profession that it should be made known, that those who would like to try it should be able to do so and judge of its merits or demerits.

At the same time I offered to write to some of those gentlemen to whom he had presented some of the metal, and to beg them to let me know their opinion. They, however, have been able to try it for only a little more than a month.

I wrote to six of the principal members of the Congress, who live in different cities in Italy.

Their reports on the whole were very favourable.

Two thought that it would be difficult to get it as hard and resisting for mastication as gold. One of these had covered the surface of a filling with a thick layer of gold to insure hardness. Another thought that it could not take the place of amalgam because it requires more force to introduce than amalgam. Another imagined that it might discolour; but he had not observed that it had done so.

However, all my correspondents agreed that it promised to be a very valuable addition to the materials for filling teeth. I have therefore thought it my duty to bring this new stopping under the notice of the Odontological Society, that it might be tried and reported on, in order that the profession may have some reliable basis with regard to its merits.

I forward to you a quantity of the preparation which Dr. Slayton has sent, also some teeth which have been filled with

it, under various conditions,—in the dry state ; moistened with water, also with saliva ; and after being dipped in oil : thus showing its cohesiveness and density.

Mr. MUMMERY then passed round specimens of the stopping that had been sent to him with the foregoing communication from Mr. Dunn.

Mr. WEISS called attention to the late fatal case of artificial teeth swallowing, as reported in "The Times," November 6th. At the inquest evidence was given that on Sunday, 28th October, John William Digby, aged 76, then in good health, while eating his dinner, swallowed his artificial teeth. Two months previous, it appears, the plate he was wearing, which was made of platina, broke in two, and the deceased had continued to wear the larger half ever since. When the accident occurred, his wife at once attempted to remove the teeth, but could not. Dr. Walsh was called in, but he also failed ; after which Dr. Durham, of "Guy's," was summoned, but he was equally unsuccessful, and eventually the man expired on the Wednesday following. A *post-mortem* examination was made, and the jury found that death had resulted from the shock, and from the injury to the throat.

The reason why the surgeon could not remove the teeth was because one portion of the plate, where it had been broken, formed a hook which caught in the muscles of the throat.

Dr. Hardwicke had most courteously placed the broken denture at his disposal, and certainly a more dangerous piece of mechanism it was impossible to imagine. It could no longer have fitted the mouth, and the man being at an advanced age, pharyngotomy was not attempted. The statement that death has resulted from the swallowing of artificial teeth is calculated to make a very unfavourable impression upon the public, but that impression is materially altered when we come to investigate these cases. We find in this, as in many other instances, that the patient must be blamed for his own negligence, the work having broken, and being worn in an imperfect state.

Mr. CHARLES TOMES showed a vulcanite flask which had been sent to him for exhibition by Mr. Palmer, of Cheltenham. It was a modification of Trill's flask, and had been contrived by Mr. Brewster, Mr. Palmer's assistant, the object being to obtain better access to the front of the mouth. It was not intended to supersede the flasks now in use for ordinary work, but would be found very useful in special cases, where the mineral teeth are so close to the gum as to make it difficult to get the rubber in front of the mouth, as well as at the back or palate, without having the flask in two pieces; the teeth being in one part and the model in the other. Mr. Palmer had found that bad fits resulted from this, through undue pressure, and that much grinding was necessary to get the teeth to bite.

The flask was closed with bolts screwed into the gun-metal and nut, while a piece of steel across the bottom formed the two points against which the nuts acted, instead of being secured by two pins, as in Trill's flask. In the larger half of the flask was a removable plate, so contrived that by unscrewing the nuts and two screw-heads, the top and front of the flask could be removed, and access could thus be obtained to the palate, back of the mineral teeth, and to the labial part and gum at one and the same time, the teeth and model being still rigidly fixed. After packing, it was easy to open or close either part for the purpose of adding or of cutting away rubber. It was also very useful for vulcanizing vulcanite teeth on gold uppers.

Mr. CHARLES TOMES next showed an improved tongue-holder invented by himself. He found that, with it and a saliva-pump he could do without the rubber dam, in many cases where he had previously found it necessary.

He also exhibited some forceps adapted for the extraction of upper molar stumps. One blade terminated in an elevator point. If necessary, he first drilled a small hole in the centre of the broken-down tooth, then inserting the point of the elevator blade into this depression, he split the roots and extracted them without change of instrument.

He then showed an interesting specimen of an odontome

attached to a lower molar tooth which he had found in the Society's Museum. A full description and drawing of this specimen will appear in the next number of the Transactions.

Mr. MOON said that the account Mr. Tomes had just given of the nature of his radicular odontome was of very considerable interest; for that specimen, though smaller in size, was, in the manner of its attachment to the tooth, remarkably similar to other recorded cases of radicular odontomes, and to the specimen which he had to show. This had been extracted by himself from a patient at Guy's Hospital. As the clinical history was interesting, he would read his notes of the case. "The patient, a married woman, aged 38, stated that eight years previously a swelling, the size of an egg, appeared over the left ascending ramus of the lower jaw; the tumefaction, which extended also within the mouth towards the fauces, was accompanied by almost complete closure of the jaws, and by excruciating pain. After eight months the swelling subsided and a bony mass appeared above the left lower wisdom tooth; this gradually increased in size in an upward direction until the patient came under my care. At that time its upper part had passed out of view and out of reach, behind the distal surface of the second upper molar and the tuberosity of the superior maxilla, even when the mouth was opened to the widest extent.

"Throughout the eight years the swelling, with its attendant closure of the mouth and severe pain in the temple and left side of the lower jaw, had recurred at intervals of two or three months, lasting for two or three weeks at a time: between these attacks the symptoms subsided entirely. The swelling had sometimes extended downwards over the neck and upwards to the zygoma, giving rise to ecchymosis around the eye; the wisdom tooth had gradually been pushed inwards towards the tongue, while the odontome had come more into view, and had polished facets on its anterior aspect, formed by attrition against the distal surface of the second upper molar. The patient, who, through dread of a surgical operation, had all this time avoided consulting

a medical man, was at length seen at the Gravesend Dispensary by Mr. Nesbitt, who kindly sent her to me. The removal of the odontome was very easily effected by extracting inwards the wisdom tooth to which it was attached."

The PRESIDENT then called upon Mr. ASHLEY BARRETT to read his paper on the "Symmetrical Extraction of Teeth."

On the Symmetrical Extraction of Teeth. By
ASHLEY BARRETT, M.B. London, M.R.C.S.

MR. PRESIDENT AND GENTLEMEN,

ALTHOUGH I should naturally desire, when reading a paper before this Society, to be able to claim at least novelty for my subject, yet our art is so wide, and our knowledge of it when compared with what yet remains to be known so limited, that I believe good may often come from talking and thinking of a topic which may have been dealt with at some former time. I have no certain knowledge that the subject of this paper has been, before this evening, brought under the notice of our Society, but I have reason to believe that in America at some of the many dental meetings attention has been given to what I have termed "The Symmetrical Extraction of Teeth."

This subject is a very practical one. Even if I succeeded in making a long paper out of it by piling up dry facts and wearisome statistics, I don't think any good would result. On the contrary, I propose telling you firstly what I have seen and have learned from others ; and secondly,

of certain inferences which I deduce from these facts. As a rule, the four sixth-year molars have not been long erupted before they undergo carious changes. The latter advance rapidly, and soon the dentist is called on to extract one or more of these teeth. One such case is now present to my mind. I removed from a child aged 12, one of the sixth year molars,—that on the left side of the lower jaw. I noticed, six months after, that the crown of the second molar—immediately behind the space whence the extracted tooth was taken—was inclined forwards; and the tendency seemed to be for the second molar to replace the six-year-old tooth. I was disappointed, however,—it did not do so, and when I obtained models and articulated them, I found the upper first molar, on the left side, having lost its antagonist, was a little raised above its neighbours, and had slightly dropped into the vacant space in the lower jaw. The posterior edge of this upper tooth caught against the front of the lower second molar, and so prevented the advance of the latter. The upper second molar was now decayed; I extracted it, and soon both upper and lower second molars came forward, and the spaces resulting from the removal of the first molars were greatly diminished.

This was an instructive case. About the time when I had it under treatment, a friend showed

me models of a mouth from which he had previously extracted all four first molars ; he had done this not merely to get rid of carious molars, but chiefly in order to relieve an overcrowded dental arch by removing therefrom the teeth which could most readily be spared. The models were taken twelve months after the extraction of these teeth, and at the first glance one failed to perceive those spaces which one naturally expected to find between the second bicuspid and second molars. On closer examination one saw that the overcrowding was greatly lessened, and that the second molars had advanced and occupied the gaps previously existing in front of them. The second molars in fact were now in contact with the second bicuspid.

Many other cases presenting similar conditions have been brought to my notice, and from them I would suggest we may deduce this guide to treatment. That where in a young mouth some or all of the first molars are carious, and co-existing with this we find any tendency to overcrowding, we are justified in extracting all four of these teeth, in the full expectation that the spaces so caused will be completely, or at any rate, in great part, obliterated by the advance of the twelve-year molars. In pursuing the treatment, however, I think it important that three points be borne in mind. First, that to extract one, two,

or three of the six-year molars is of no avail, but that all four of these teeth should be removed ; or if it be the bicuspid with which we are dealing (and to which all I have said of the molars will equally apply), we should not be content till we have taken out all four of the series, and so produced what I have termed their “ symmetrical removal.”

I am aware that too often the operator will meet with objections from the friends of his young patient, who may not appreciate the advantages which are in the future to flow from the present sacrifice of what are perhaps perfectly sound teeth ; but the relatives may be assured that unless the treatment is carried out in its entirety, the spaces resulting from the extraction will never have a chance of being properly closed.

The second point I desire to indicate is, that it is well not to practise symmetrical removal of six-year molars, till the four twelfth-year molars are erupted, or show unmistakable evidence of being about to be cut. It would at any rate be unfortunate to extract the sixth year teeth, and having assured the friends that the spaces so caused would shortly be occupied, to find the eruption of the second molars to be greatly retarded, or possibly even not to occur at all. It is well, therefore, to delay the operation till the four teeth expected to fill the gaps are in sight.

My third point relates to the age of the patient at which symmetrical extraction should be practised. I think it is well, when one finds the majority of the first molars carious in a crowded dental arch, to extract these four teeth very shortly after the eruption of the twelve-year molars, and before the latter have reached their ultimate height. Since, without doubt, these latter teeth are most freely moved in any direction shortly after they are cut, and before the crowns of the upper and lower molars come into contact. To this latter condition I would attach considerable importance, and would advise that the most favourable period for the symmetrical extraction of six-year-old molars is when the grinding surfaces of upper and lower molars barely touch, in fact, shortly after their complete eruption at about the twelfth year of our patient.

In conclusion, let me say, the force which determines the advance of teeth into spaces situated before them, is perhaps a little obscure. Is it that movements of mastication tend to push the teeth towards the mesial line? Is there a *vis a tergo*, represented perhaps by the growing wisdom tooth, which operates upon the second molars? Or is it that, having by the act of extracting the first molars, established a cavity in front of each second molar, the latter naturally falls forward to occupy it; thus yielding in the

direction of the least resistance to the various forces which operate on it. For information on these points I shall feel indebted to any gentleman who can contribute it. My series of models, I regret to say, is not by any means as complete as I could wish. Such as I have, however, show fairly well the complete obliteration of a space caused by extraction, which may result from the advance of the posterior teeth.

DISCUSSION.

The PRESIDENT said that although there was nothing novel in Mr. Barrett's paper, it opened up a practical question which was constantly coming before members in their work, and on which all could say something from experience. Mr. McClean had read a paper on the same subject in the early days of the Society, and it was not new even then, for he had himself undergone the operation many years before that. He agreed with Mr. Barrett that great benefit resulted in many cases from the symmetrical extraction of the first molars, but there was one fact to be remembered when the question arose as to their removal to relieve overcrowding, and that was, that though the back teeth would come forwards, and fill up the gap, the front teeth did not always move back, and so the overcrowding continued. For this reason some advised that one of the bicuspid should be removed on each side, instead of the molars, as being less likely to be followed by disappointment from this cause, and he remembered one gentleman stating that he had removed all four bicuspid.

No doubt the friends of young patients often objected to the removal of sound teeth, and he had sometimes been induced to give in to their wishes, but had generally repented of his weakness; for if the teeth were not removed on both sides, the central incisors were very apt to be pushed across the middle line, and the symmetry of the mouth was thus seriously marred.

Mr. MUMMERY said he was glad to hear Mr. Barrett advise that the first molars should not be taken out until the second molars were properly developed: this was a point on which he should lay great stress. A common result of premature extraction was, that the second molars, instead of rising vertically into

their places, leant forward and never articulated properly with their fellows. He thought, moreover, that the first molars had received a worse character than they deserved. No doubt, in most of the cases they met with, there was nothing to do but to extract, but this was not because the teeth were specially difficult to treat, but because the patients did not come under observation early enough. When the large size of the pulp-cavity in the first molar was considered, it must be evident that the tooth must be stopped early, else the pain would be very great. He could call to mind several families in which the elder children had lost their first molars, but on extracting these he had given directions that the younger members should be brought to him as soon as any disease appeared, and in these he had been able to stop successfully, some as young as the seventh year, and they had grown up without any further extension of the caries. These teeth were often somewhat imperfect ; there were frequently a good many little fissures on the grinding surface, due to the diseases of infancy ; but if parents could be induced to watch and to bring their children *before* they complained, they might be preserved for years in a very serviceable condition. For the relief of overcrowding, he greatly preferred to extract a pair of bicuspid—*but always a pair.*

Mr. OAKLEY COLES thought it was questionable how far overcrowding could be prevented by extracting teeth early, that is, before the molars were completely erupted. He thought it was pretty well ascertained that the growth of the jaws depended to a great extent on the growth of the teeth, and thus, unless all the teeth were present, the jaw was not fully developed. This fact was well exemplified in the case of the hairy "Kostroma people," who were exhibited in London a few years ago, and whom he had an opportunity of examining in company with Mr. Charles Tomes. These people, an old man and a boy, were practically edentulous, and they found that the jaw of the old man was not more developed than that of the boy seven years old. The practical inference from this was that in

young patients, teeth should be left as long as possible, and that, except under urgent necessity, none should be extracted until all were erupted.

The PRESIDENT said that Mr. Coles' statement was not true without exception. He had met with cases at the Children's Hospital in which the gap left after the extraction of teeth had perceptibly increased, showing that the jaw grew independently and in spite of the removal of teeth.

Mr. HUNT said that on examining the models which Mr. Barrett had sent round, he found that the jaw from which the bicuspid were absent was smaller than the other, although the patient was said to be a year older; the canines also in the later model seemed to have been forced more out of position than they were before.

Mr. VANDERPANT suggested that there had been some mistake; the models could not have been taken from the same mouth.

Mr. A. BARRETT said that all he wished to call attention to in the model was that the second bicuspid were in contact with the canines, the spaces left after the extraction of the first bicuspid having quite disappeared.

Mr. HUTCHINSON said he remembered reading Mr. M'Clean's paper in the Transactions for 1856, and though the subject was old even then, still it had not been fully discussed since, and would be interesting to many of the members present; he thought, therefore, that they were indebted to Mr. Barrett for bringing it again before the Society. Mr. Mummery had raised the question whether it was not preferable to stop the first molars. He thought that the practice was generally to extract them either on account of caries or of overcrowding; but each case should be considered on its own merits. If they were much decayed, and the front teeth were crowded, it was best to extract them; but if the other teeth were regular, he should try stopping, unless they were so far gone that the pulp was exposed. For the relief of

simple overcrowding, he much preferred to extract the first bicuspid: he found that the neighbouring teeth fell together much more quickly and easily than they did after removal of the molars, and that regulation-plates could be safely dispensed with. He quite agreed with Mr. Barrett's opinion that it was advisable to wait until the second molars were completely erupted before extracting the first molars. He thought that the tendency of these teeth to move forwards was partly accounted for by the fact that the oblique fibres of the buccinator muscle were attached to the jaw over their roots, and that the dragging of this muscle on the deeper part of the tooth might also explain the tendency of the crown to fall forwards, which had been spoken of by Mr. Mummery. In conclusion, he would hand round some models which showed the evil results of unsymmetrical extraction.

Mr. MOON remarked that there was one condition which should always contra-indicate the extraction of the first molars, viz., where the cutting edge of the lower incisors impinges on the necks of the upper. The fact to which the President had called attention also deserved notice, that although the molars moved forwards, the bicuspid did not always move back. He thought this depended a good deal on the position of the canine: if this was just coming down, its wedge-like form might press back the bicuspid, but if it was already fully developed, the chance of the bicuspid moving back was not so good.

Mr. BARRETT having been called upon by the President for his reply, said that he had nothing further to say, except that he could not consider Mr. Hutchinson's supposition a satisfactory answer to his query respecting the cause of the forward movement of the teeth. The buccinator muscle was not attached to the alveolar portion of the jaw, and he could not see how its superficial attachment could affect a tooth implanted in the bone at some distance from it.

The PRESIDENT reminded the members present that it was necessary to appoint two auditors to examine the Treasurer's accounts.

Mr. Fairbank was then proposed by Mr. Turner, and Mr. Hutchinson by Mr. A. Barrett, and these gentlemen were unanimously elected to the office.

The PRESIDENT having thanked the various members for their contributions and Mr. Ashley Barrett for his paper, announced that the Annual Meeting of the Society would take place on January 14, and that it would be made "Special" for the discussion of a proposed change in the Bye-laws of the Society.

The meeting then adjourned.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN



THE following application for Membership has been received by the Council.

EDWARD THOMAS PAYNE, 2, Sussex-place, Southampton,
Non-resident.

ANNUAL GENERAL MEETING,

January 14th, 1878.

SAMUEL CARTWRIGHT, Esq., PRESIDENT, IN THE
CHAIR.

THE Minutes of the previous Meeting having been read and confirmed, the following gentlemen were nominated for Membership :—

Mr. GEORGE AUGUSTUS COURTENAY BENHAM, 155, Woodhouse-lane, Leeds, Yorkshire, Non-resident.

Mr. CHARLES SIBTHORPE BRIGHT, L.D.S., R.C.S., 14, Via Assalotti, Genoa, Italy, Non-resident.

Mr. JOHN LAWS, 125, St. George's-road, Bolton, Non-resident.

The following gentlemen having been balloted for, were declared duly elected :—

GEORGE FREDERICK PASMORE, Esq., 22, Queen-street, Exeter, Non-resident.

ANDREW ROBERTSON, Esq., 25, Castle-street, Hereford, Non resident.

Dr. MAGITOT, of 8, Rue de St. Père, Paris, was, on the recommendation of the Council, unanimously elected a Member of the Society.

Mr. CLAUDE ROGERS exhibited a saliva-pump, constructed on the same principle as that which he showed at the November meeting, but differing from that in not requiring an independent supply of water. The vertical tube issued from the bottom

of a small iron reservoir, which could be suspended from a nail in the wall, and which held enough water to keep the pump in action for about four hours. At the lower end of the vertical tube was a water-valve, which greatly increased the suction-power, since, in the event of any obstruction of the mouth-piece by viscid saliva, &c., the water would rise in the tube above the valve, until its weight was sufficient to overcome the resistance. Mr. ROGERS added that the Dental Manufacturing Company had made a somewhat similar apparatus, but he claimed that his was cheaper, and simpler in construction.

He also showed a shield which he had found very useful for keeping the tongue out of the way while stopping deciduous teeth, and for small cavities, where it was not worth while to use the rubber dam. The shield was fixed by a spring clip, which passed round the neck of the tooth, and had at the base a ring, which received, and kept in position the nozzle of the saliva-pump.

Mr. STOCKEN showed an improved form of combined amalgam carrier and plugger, which had been made from his designs by Collins, of Poland-street.

Mr. BELL LONGHURST exhibited a model of the upper jaw of a lady, showing great absorption of the anterior alveolar border and palate, caused by the persistent pressure of a pad of soft paper between the roof of the mouth and an old misfitting denture, which, by age, had become too short; the object of the pad being to make the artificial teeth appear much longer, and to produce a certain amount of suction. The pad merely consisted of paper roughly folded several times upon itself, about an inch square, and fully half an inch thick. It was renewed daily, and had been increased in bulk year by year, as the absorption advanced.

Mr. VANDERPANT remarked that a good deal of pain was sometimes caused by the pressure of a clasp round the neck of a tooth. He found that this was very speedily and effectually

removed by painting over the tender part a mixture of collodion and morphia, of the strength of four grains of the latter to a drachm of the former. Ten minutes after the application, the plate could be re-inserted, and worn without inconvenience.

The PRESIDENT then called upon the members present to nominate six of their number, two of whom would be appointed by himself to act as Scrutators.

The following gentlemen were accordingly chosen :—Messrs. O'Duffy, Ibbetson, George Henry, R. Rogers (of Cheltenham), George Payne, and I. Lyons.

The PRESIDENT then appointed Messrs. Henry and Lyons Scrutators of the Ballot.

The PRESIDENT next called upon the Treasurer, Mr. James Parkinson, to present his annual report, which will be found appended to the present number of the Transactions.

The PRESIDENT then requested the Librarian to read his statement.

Mr. THOMAS A. ROGERS then rose and said—"The usefulness of the Library is constantly increasing, 107 books having been borrowed during the past year, against 88 the year before. I regret to say the following works are missing, and I shall be greatly obliged to any Member who may happen to have any of them in his possession, if he will kindly return them at his early convenience:—No. 173a, Heath's 'Injuries and Diseases of the Jaw'; No. 260, 'Journal of Anatomy and Physiology, vol. viii.; No. 303, Kölliker's 'Manual of Human Microscopical Anatomy'; No. 408, Garretson's 'Oral Surgery.'"

Mr. CHARLES TOMES then gave in the following report as Curator of the Museum :—

"The donations to the Museum during the past year, though perhaps not as numerous as in some preceding years, have been of as great interest. Among the more valuable presents may

be noted a fine lower jaw of the gigantic extinct Kangaroo (*Diprotodon*) presented by Mr. Eden, a fine Cingalese Elephant's skull presented by Mr. Mummery, and a skull of *Stenorhyncus* presented by Mr. Howard Mummery. But few additions have been made by purchase, specimens of sufficient interest not having been met with ; a few typical and instructive specimens have, however, been secured for the series illustrating Comparative Odontology.

“The attention of Members of the Society is drawn to a resolution of Council to the effect that specimens must on no account be removed from the Museum without the written sanction of the Curator, the breach of this rule having led to some little disarrangement of the cases.”

The PRESIDENT then delivered the following address :—

PRESIDENT'S ADDRESS.

GENTLEMEN,—It is the penalty of those who are advanced in age to find each year pass by more quickly than the last. It seems to me but a very short time since my predecessor delivered his farewell address from this chair, and now I am called upon to do the same. And yet, on looking back, I realize that a great deal has occurred during the past twelve months, both in the political and in the social world. There has been a dreadful famine in one part of the world, a disastrous war in another, whilst financial difficulties and a depressed state of trade have been more or less general. At home we have had to contend with strikes and consequent distress amongst large sections of the labouring population, while the middle and upper classes have suffered from the dishonesty of certain foreign states, who, after availing themselves liberally of our pecuniary assistance, have not thought it necessary to pay their debts. There has then been more or less want amongst all classes of the community, and I doubt whether even dentists have escaped. But whatever have been the troubles of

the outer world, the Odontological Society has not been affected by them ; the Treasurer's report shows that the Society is in a thoroughly healthy state, both numerically and financially, and I congratulate the Members on that fact.

A review of the work done during the past session is, I think, equally satisfactory. Some excellent papers have been read, and have been followed by interesting and instructive discussions. First, Dr. Arkovy gave us a valuable paper, the result of much painstaking investigation ; then Mr. Weiss gave us a carefully prepared summary of published cases on the swallowing of artificial teeth, in which he showed that this accident was more common than had been previously supposed, and gave some valuable hints as to necessary precautions, and the best recorded methods of treatment.

Mr. Moon's paper was an important one, both in itself and on account of the interesting discussion which it elicited, in the course of which Mr. Jonathan Hutchinson gave us the results of his inquiry into the effects of syphilis on the teeth, to which he has, for some years past, devoted much valuable time and thought. Then Mr. Ashley Barrett favoured us with a useful and instructive paper, and Mr. H. Hutchinson gave us the results of his method of curing alveolar abscess by means of carbolic acid, and read the notes of cases thus

treated. I may add that, in my opinion, notes of actual cases give weight to any communication, and are far more valuable than any mere general expression of opinion can be.

The casual communications have been quite up to the average in interest and importance, and several most useful and ingenious contrivances have been brought under the notice of the Society ; such, for example, as Mr. Hunt's adaptation of Morrison's engine and Mr. Claude Rogers' saliva-pumps.

My predecessor was able to state in the course of his address that not a single death had occurred among the members of the Society during his year of office. I cannot say the same, but, fortunately, our losses have been few. Two ordinary members have died during the year,—Mr. F. Bradley and Mr. George Bennett; the latter, especially, will be generally regretted, for he had been a member of this Society for many years, and was widely known and respected by the members. In Sir William Fergusson we have lost an honorary member, who was not only a surgeon of exceptional skill and experience, but also a most genial and kind-hearted man, and one who, notwithstanding his high position in the medical profession, was always ready to assist his junior brethren.

The Treasurer's report shows that the Society is flourishing, and I trust it may long continue to flourish. But this room must be kept as neutral ground, where all who are interested in the progress of dental science may meet and debate with advantage to themselves and the profession: the discussions must maintain their scientific character, and political questions must be carefully excluded. So long as this important point is kept in view, I see no reason why the Odontological Society of Great Britain should not have a long and prosperous career before it.

In conclusion I have to thank you most heartily for the honour you have done me in electing me a second time to fill the office of President: I have also gratefully to acknowledge the courtesy of the officers and members of the Council, which has done much to lighten my duties, and to express the satisfaction I feel that, if the recommendation of the Council be agreed to, I shall resign this chair into the hands of so able and popular a successor.

Mr. UNDERWOOD rose to express, on behalf of the members, their gratitude for, and appreciation of, the time and attention which the President had devoted to the affairs of the Society during the past year. He wished to thank him most heartily for all he had done and to assure him that all the members, without exception, were his sincere well-wishers.

The PRESIDENT thanked Mr. Underwood and the members generally for their good wishes : he had endeavoured to perform the duties of his office to the best of his ability, and was very pleased to find that his efforts had been appreciated.

Mr. ASHLEY BARRETT proposed a vote of thanks to the Treasurer : he felt sure that the satisfactory report they had lately heard from Mr. Parkinson was in great part due to the careful way in which he looked after the Society's finances.

Mr. PARKINSON thanked the Society, and hoped he should be able to give as satisfactory a report next year.

Mr. WEST thought that the thanks of the Society were due to Messrs. Turner and Coles ; they were two of the most energetic and assiduous Secretaries which the Society had yet had, and he hoped it might always be able to meet with their equals.

Mr. TURNER replied on behalf of his colleague and himself : he was glad of the opportunity of acknowledging his obligation to Mr. Sewill : having been suddenly called upon to undertake the duties of Secretary, of which he had little experience, he was greatly indebted to Mr. Sewill for the kind way in which he prompted him at the outset and explained all his difficulties.

Mr. VASEY proposed that the thanks of the Society be given to the Librarian and Curator. They were two valuable officers, and he could assure them that their services were thoroughly appreciated.

Messrs. ROGERS and TOMES having briefly replied, the Scrutators presented their report and the President announced that the list of officers recommended by the Council had been unanimously elected.

The PRESIDENT then declared the Meeting "Special," and requested that all who were not members of the Society would retire.

The visitors having left the room,

The CHAIRMAN said,—Gentlemen, we have now to consider the following bye-law which has been recommended for adoption by the Council: "That after January 1st, 1880, no person be admitted a candidate for the Ordinary Membership of the Odontological Society unless he possess the Dental Diploma of the Royal College of Surgeons, or such other qualification in Dental Surgery, Medicine or Surgery, as the Council may deem sufficient." I may state, for the information of the more recently elected members of the Society, that this proposal has been mooted in the Council for years. Ten years ago, after much previous deliberation, a similar resolution was brought forward at a General Meeting by Mr. Thos. Rogers; but although it was generally admitted that some such measure was desirable, it was thought that the Society was not then sufficiently strong to take such a step without some risk of damaging its immediate prospects, and that the proposal was therefore premature. Since that time the numerical strength and the influence of the Society have greatly increased, and during the past year the Council has carefully reconsidered the matter, and has come to the conclusion that the time has now arrived when the possession of some legally recognized guarantee of competent knowledge—a diploma in fact—may reasonably be expected of all candidates for the membership of this Society. With this brief statement of the history of the measure I leave the matter in your hands.

Mr. UNDERWOOD wished to draw the attention of members to the fact that during the coming Session a measure would be

brought before Parliament, which would have a most important influence on the future prospects of the Dental Profession. A Bill would be introduced which would enable three important medical corporations—viz., the College of Surgeons of Edinburgh, the College of Surgeons of Ireland, and the Faculty of Physicians and Surgeons of Glasgow—to grant licenses in dental surgery. He thought that, under these circumstances, it would be more courteous for them, as the representatives of the Dental Profession, to postpone the consideration of this law until they could include these Corporations by name, and not to compel their licentiates to obtain admittance to the Society by virtue of an appended clause or rider of very indefinite signification. The proposal had remained in abeyance for some years,—its further adjournment for a few months could do no harm to the Society; he would not, therefore, enter into the merits of the question, but would simply move the following amendment—"That the consideration of the proposed bye-law be postponed for the present."

Mr. VASEY said he would not generally oppose any proposition emanating from the Council, and he knew how carefully it had considered this particular measure. But he had been so much impressed by the justice of Mr. Underwood's remarks that he should feel it his duty to vote for the amendment. As by the terms of the motion two years would elapse before it would come into operation, it might be passed just as it stood at the end of the Session, or even next year, and the only consequence of the delay would be a shortening of the period of grace.

Mr. OAKLEY COLES thought that there was something to be said in favour of immediate action. The Council had considered the whole question most carefully, and had brought forward the motion in no captious spirit. Certainly there was in the Council no such feeling of opposition to the Corporations as Mr. Underwood seemed to infer. It was only within the last week that the executive of the Dental Reform Association had been able to state positively that their Bill would be sup-

ported by the Corporations, whilst the Council had had the matter before it for nine months, and had given ample notice of their intention to bring forward this resolution. He did not see that any sufficient reason had been given why they should withdraw it.

Mr. CHARLES TOMES said he was most strongly of opinion that it would be for the benefit of the Profession and of the Society that some such law as the one proposed should be passed. But he thought also that the introduction of such a measure at the moment when the Legislature were just about to consider the whole question of dental qualifications was inopportune. On the other hand, he did not wish to see the motion shelved for an indefinite period, and he would suggest that some date be named in the amendment at which the subject should be again brought before them—say “till the end of the Session,” or “till the next Annual Meeting.” If, when that time arrived, the present difficulty had not been disposed of, the question might be again postponed.

Mr. HENRY BARRETT said he could not see that it would be any slight to the Corporations if the law was passed as it stood. The Bill, if it was passed, would only increase the number of dental diplomas, but would not affect the value of the existing diploma of the College of Surgeons. The names of the other colleges could easily be inserted later, whenever they succeeded in obtaining the powers they were about to apply for. He did not think that there was any occasion to wait for this event; no one knew what might be the pressure of Parliamentary business during the coming session. He advocated that the meeting should vote on the motion.

Mr. ASHLEY GIBBINGS suggested that if the adoption of the bye-law was postponed till after the passing of the Act, it would be more difficult than ever to exclude unqualified men from the Society, since, by the Act, all existing practitioners, whether qualified or not, would be legally recognized and registered.

Mr. THOMAS ROGERS said he had always wished that some such measure as that proposed should be passed, but he should

not have chosen the present moment for the purpose. His objection to the rule as it stood was that it left too much to the discretion of the Council ; as the component members of that body were constantly changing, so the opinion of the majority might vary from time to time, and thus the application of the rules might not be always consistent. Of course it would be open to the Society to amend the law later on by inserting the names of other licensing bodies, but he agreed with the previous speakers, that it would be better to wait till matters were settled, and then to pass one well-considered rule, rather than to patch this one by a series of partial amendments.

The CHAIRMAN said he could not see how the proposed Bill affected the question before them. Their rule would not in any way clash with the legislation which they were assured was in prospect ; for it merely affirmed the principle that a diploma was necessary, whilst it allowed the Council free scope for the consistent application of this principle. He thought that the prospect of the Act being passed during the coming Session was, to say the least, very doubtful ; certainly it was not likely to receive much attention from the House just at present. He could only repeat that the resolution had been brought forward by the Council after the most earnest deliberation ; it was, however, for the members generally to decide whether they would accept it or not.

Mr. GADDES said that as the Society was asked to defer the consideration of this rule, on account of a measure which was to be introduced into the legislature, he would remind members that there was another larger measure looming in the distance—the “Conjoint Scheme.” If they deferred action on account of this proposed Bill, why should they not afterwards be asked to defer it again on account of the Conjoint Scheme, which, if it became law, would override all the existing licensing bodies. If they were to wait for the passing of the one measure, it would only be consistent to wait for the passing of the other. If these licensing bodies should obtain the power to grant

diplomas in Dental Surgery, the wording of the bye-law was sufficiently comprehensive, and not in the least uncourteous towards them. Besides, the Society, as such, knew nothing about this Bill; it had been kept altogether private, or, at all events, had never been submitted to the notice or approval of the Society, and therefore he did not see why they should take the Dental Reform Committee into consideration, or postpone the adoption of the bye-law.

Mr. VASEY said he hoped that the Society would understand that no discourtesy had been intended by the Dental Reform Committee. They had had to deal with various slowly-moving Corporations, all acting independently and at a distance from each other; the negotiations had consequently been tedious, the issue had been doubtful almost to the last, and they had only just been able to arrive at a satisfactory agreement. It had been, in fact, only within the past week that the Committee had had anything definite to bring before the notice of the Society. The fact that Parliament had been summoned so much earlier than usual had also added considerably to their labours.

Mr. ASHLEY BARRETT suggested that it would probably solve the doubts of many members if they could be informed whether the adoption of this rule had been unanimously recommended by the Council or whether it had only been sent down to them by a small majority.

Mr. TURNER answered that Mr. Barrett had no right to inquire as to what had passed at the Council: it would however be evident to members that, when the Council decided the question, it had no knowledge of the important facts which had been stated that evening.

Mr. DENNANT said he should support the amendment as being the course most likely to make matters go peaceably and to avoid useless discussion. He had great hopes that the Bill would be passed this Session; it had been placed in the hands of a gentleman of great experience, who had considerable influence in the House, and who had probably secured the

passing of more private Bills than any other member. If it should become law, the status of the Dental Diploma would be greatly changed and a much more favourable opportunity would be obtained for the full discussion of the Council's proposition.

Mr. CHARLES TOMES wished to ask Mr. Underwood, before the amendment was put to the vote, whether he would not add a date to which the discussion might be adjourned?

Mr. UNDERWOOD thought it would be more courteous to the Council not to do so. He would leave it to their discretion, on the understanding that the subject should not be brought forward again until the Legislature had decided the question which would shortly be submitted to it.

The amendment was then put from the Chair, and, on a show of hands, was carried with but one dissentient : many members, however, did not vote.

The CHAIRMAN then declared the meeting adjourned until the first Monday in February, when the new President, Mr. Alfred Coleman, would read his inaugural address.

*The Treasurer in Account with THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.
Financial Statement, 1876-1877.*

| DR. | | CR. | |
|--|------------------|--|-------------------|
| To | £. s. d. | By | £. s. d. |
| Balance at Bank and in Treasurer's Hands, Oct. 31, 1876..... | 299 0 1 | Rent (one year) | 50 0 0 |
| Annual Subscriptions | 369 12 0 | Printing and Publishing, including Postage, &c., of "Transactions" | 192 9 0 |
| Entrance Fees | 55 13 0 | Stationery | 5 16 0 |
| Arrears | 17 17 0 | Reporting | 21 0 0 |
| Interest on Stock | 31 18 11 | Refreshments | 22 4 6 |
| Sale of "Transactions" | 12 17 6 | Library and Museum | 9 14 5 |
| | | Petty Disbursements | 9 7 6 |
| | | Postage and Receipt Stamps, Secretary and Treasurer | 12 3 6 |
| | | Investment of Divi'dends | 31 18 11 |
| | | Salary of Secretary | 26 5 0 |
| | <u>£786 18 6</u> | | <u>£380 18 10</u> |

ASSETS OF THE SOCIETY, OCTOBER 31st, 1877.

| | | | |
|---|------------------|--|--------------------|
| Total Receipts for the Session 1876-7 | £487 18 5 | Stock in New 3 per Cents | £1,102 1 3 |
| Total Disbursements ditto | 380 18 10 | Cash at Bankers and in Treasurer's Hands | 405 19 8 |
| | <u>£105 19 7</u> | | <u>£1,508 0 11</u> |

STATEMENT OF DEATHS AND RESIGNATIONS OF MEMBERS, AND
NEW MEMBERS ELECTED DURING THE SESSION 1876-77.

| | |
|--|-----------|
| Subscribing Members—Resident | 101 |
| " " Non-resident | 189 |
| | <hr/> 290 |
| Honorary | 30 |
| Corresponding | 21 |
| | <hr/> |
| TOTAL | 341 |
| | <hr/> |

| | |
|--------------------------|-------|
| Deaths..... | 2 |
| Resignations | 4 |
| Removed by Council | 1 |
| | <hr/> |
| TOTAL | 7 |
| | <hr/> |

| | |
|--|-------|
| New Members elected—Resident | 7 |
| " " Non-resident | 16 |
| Honorary Members | 4 |
| | <hr/> |
| TOTAL | 27 |
| | <hr/> |

OCTOBER 31st, 1877.

| | |
|---|-----|
| Number of Subscribing Members—Resident and Non- resident | 290 |
|---|-----|

OCTOBER 31st, 1876.

| | |
|---|-------|
| Number of Subscribing Members—Resident and Non- resident | 268 |
| | <hr/> |
| Increase | 22 |
| | <hr/> |

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.



THE following application for Membership has been received by the Council.

EDWARD THOMAS PAYNE, 2, Sussex-place, Southampton,
Non-resident.

ORDINARY MONTHLY MEETING,

February 4th, 1878.

ALFRED COLEMAN, Esq., PRESIDENT, IN THE CHAIR.

THE Minutes of the previous Meeting having been read and confirmed, the following gentlemen were proposed for election :—

Mr. GEORGE AUGUSTUS COURTENAY BENHAM, 155, Woodhouse-lane, Leeds, Yorkshire, Non-resident.

Mr. CHARLES SIBTHORPE BRIGHT, L.D.S., R.C.S., 14, Via Assalotti, Genoa, Italy, Non-resident.

Mr. JOHN LAWS, 125, St. George's-road, Bolton, Non-resident.

The following gentlemen were then balloted for, and elected Members of the Society :—

MARK J. BLOOM, 23, Westland-row, Dublin, Non-resident.

GEORGE BRUNTON, Leeds, Non-resident.

CHARLES NORMAN KING, 7, Bedford-circus, Exeter, Non-resident.

HENRY AUGUSTUS KING, 7, Bedford-circus, Exeter, Non-resident.

THOMAS MURPHY, Moss House, Bolton, Sunderland, Non-resident.

THOMAS F. PEDLEY, 9, the Terrace, Camberwell, Resident.

JAMES COWAN WOODBURN, 275, Sanchiehall street, Glasgow, M.D., S.F.P.S.G., Non-resident.

During the progress of the ballot Mr. J. S. TURNER rose to explain a matter personal to himself, which was, perhaps, of small importance, but which he did not like to pass without notice. In the last number of the Transactions he was reported to have said, in answer to an inquiry from Mr. Ashley Barrett, that "Mr. Barrett had no right to inquire as to what had taken place at the Council." The answer as it stood seemed scarcely courteous, and if, on the spur of the moment, he had used those words, he thought it only right to apologize to Mr. Barrett, and to the Society.

Mr. ASHLEY BARRETT said that whether Mr. Turner had used these words or not, he certainly did not speak in an uncourteous manner. He himself had no sooner uttered the question referred to than he felt it could not be answered as he wished : he took Mr. Turner's remark, therefore, simply as a statement of fact.

The PRESIDENT then delivered the following address :—

GENTLEMEN,

I THANK you sincerely for the honour you have done me in exalting me to the Presidency of this Society ; a position, however, which involves such responsibilities, and for its successful occupation demands so many qualities I know myself to be wanting in, that I should assuredly have declined the responsibilities and the honours but for two considerations, firstly, that I feel confident the qualities I lack will be more than supplied in my colleagues, the officers and Council who nominated me for the post, and, secondly, that I may assuredly count on your forbearance in regard to my shortcomings.

The year of my presidency is one likely to be eventful in the chronicles of Dental history, for though I can hardly venture to believe that so important a measure as that now before Parliament will ere a year passes become the law of the land, yet in that period, doubtless, will be determined the important question, viz., whether Dental Surgery shall become a legally recognized profession or

continue to exist a business or trade. Now although this Society does not, and I think most wisely, individualize itself in political movements, yet I may venture so far as to pronounce, that I am convinced the majority, if not all of its members, sincerely desire the former, and not the latter condition; and as to the public at large there can be no question as to which is for its interest. It would be unreasonable to expect that a measure of such importance should meet the views and wishes of all parties concerned, and whilst some will see in it a clear gain, others will doubtless perceive in it some loss. If, however, the measure be essentially good and for the general weal, it will become one and all to unite in bringing it to a successful issue; on the other hand, I have no reason to doubt but that those who have so energetically forwarded the work to its present advanced stage, will listen to any reasonable suggestion, and concur in any alteration which may be shown to render the measure more perfect or more just.

To turn to matters which more intimately concern our Society, viz., the furtherance of Odontology, under which we include Dental Anatomy and Physiology, also Dental Surgery and Pathology, and some other subjects bearing upon these. In regard to the first two divisions, I cannot but regret we count amongst our members so few workers in

these departments of Science. Fortunately the work of one of our members has been so excellent and so original that he has redeemed us from reproach ; let us hope he will continue his valuable investigations, and occasionally, as heretofore, make this Society the medium for publishing his results, and also that others may be found competitors in the same field, to which he, I am sure, will be the last to object.

The subject of Dental Surgery opens, to my mind, a question of considerable importance, and one not unattended with feelings of some anxiety ; feelings which have been intensified by the perusal of some really excellent letters which have of late appeared in the Dental Journals ; the matter can, I think, but be best put in the form of a query, thus, —“ Are our efforts to cope with dental diseases in the present day commensurate with their rapid increase and altered character ?” believing as I do, in common with the writers alluded to, that this query must be answered in the negative, it becomes natural to inquire whether this arises from any want of skill, energy, or perseverance on the part of those who undertake the treatment of such diseases, or whether it results from any want of means or appliances equal to the emergency. Now I think if one thing be obvious in regard to Dental Surgery in the present day, it is the fact that dental practitioners are both in general know-

ledge and skill vastly in advance of what they were even a few years ago ; indeed we could fairly challenge any comparison which could be made between the conservative efforts in Dental as compared with General Surgery ; to any sceptic on this point, I would recommend a visit to our Dental Hospital in order that the work of the demonstrations in gold filling, as now conducted under its present efficient supervisor, may be witnessed and tested ; but in speaking of the skill attained in manipulating with gold especially, I should fail in justice were I not to acknowledge the debt of gratitude we owe to our American *confrères*, who have most certainly been our pioneers and chief guides in this direction ; yet nevertheless, and notwithstanding all this skill, ingenuity, and perseverance I much doubt if our efforts are (indeed, I believe they are not) attended with as successful results as they were some twenty or forty years ago, and under far less favourable conditions as regards at least skill, material, and appliances. Now it seems ungracious to attack an old servant because the conditions of his service have so altered that his capacities are no longer equal to the requirements, one, too, that so well fulfilled its duties as at one time to be pronounced, by many, the only material suitable for filling teeth ; but this has again and again had to be modified, until a suspicion has arisen that ere long if the work is

to be carried on so as to maintain its long-deserved conservative reputation, the use of gold must be confined to the exceptional, and not the generality of cases. I know I am treading on delicate ground, for it is hinting at the uselessness of that skill of which the possessors may feel justly jealous, but I cannot but believe if the same energy and talent which are now being expended in making one agent to meet the rapidly growing wants of our age, were directed to the same extent in seeking another better adapted to its altered requirements, we should be more successfully advancing Dental Surgery. I wish I could offer some practical hint, or point out the path likely to lead to this desired end. I will only remark, that if to one of our most, if not the most, untrustworthy agent we employ we could give trustworthiness, *i.e.* of rendering it insoluble in weak acid or alkaline solutions, or indeed perhaps in neutral solutions, we should be in the possession of something more approaching our "Philosopher's Stone."

Closely connected with this question, based as it is upon the subject of dental degeneracy, is the still more important one evidently gaining ground that the teeth are becoming obsolete; and if so, are we but attempting to prop up antiquated and degenerate institutions? This is a question we shall some day have to face, but in the interim, suffering humanity calls for help.

Under the head of Dental Pathology, a censure, and, I fear, a not wholly unmerited one, hangs over our own ; with a disease occurring on the very surface of an organ, fairly exposed to view, and which may be watched from its very commencement to its close, we are yet amongst ourselves wholly undecided as to its true nature and cause ; and assuredly no disease has ever been honoured with so many and varied theories as has Dental Caries. Surely there exists amongst us some master mind who can deliver us from this reproach, some member of our Society, let it be, who with facts unassailable, with arguments incontrovertible, shall demonstrate one of the present, or some new view to be so true, that there shall no longer exist the necessity for a *theory* of Dental Caries ; and may this be accomplished in the year of grace 1878.

Another matter hardly coming under any of the heads I have named, although closely connected with some of them, is the treatment of Dental Irregularities. It is a very important department of our calling, and certainly an increasing one, yet becoming daily more difficult to deal with on account of the mischief our very means of treatment induces ; the weaker teeth of the present race suffering so much from the effects of plates and other mechanical appliances. Still, in regard to the subject generally, there are some points on

which it were well we were a little more in harmony. I know the impossibility of attempting to lay down general rules in matters where so many considerations must enter into our calculations, yet I cannot but think we should be able to arrive at some general opinions in regard to the subject were we to adopt the suggestions of our esteemed curator, and bring before the Society cases illustrating treatment from beginning to end, and by end, I would argue, he meant not merely the discontinuance of a plate, but the actual result some four or five years subsequently. I am often distressed at the appearance of cases I gloried in some three or four years previously, and especially cases treated conservatively to an extreme degree. I do hear of practitioners who expand, or profess to expand, a dental arch in six or eight weeks so that erratic canines slide down into ample space where none previously existed. How about such cases in three or four years' time if the treatment be *not* continued? and how about the condition of the teeth themselves if it have been? Some such points in regard to treatment by expansion or removal of teeth might, I think, with much profit occupy the Society's attention.

Gentlemen, these observations have been made to show that we have by no means exhausted the subjects most profitable for the Odontological Society to consider and discuss, we have indeed

abundance of material in hand, far more than our eight ordinary meetings in each year can consume, yet it does occur at times that we lag for it, and our worthy secretaries have to undertake the somewhat ignoble work of press-gang, the results of which often, I think, illustrate the proverb connected with volunteers and those so obtained. Such being the case, we do, I fear, want more earnest workers amongst us, and such as will pursue their investigations to ulterior conclusions; we often relinquish our work at the very time we should most pursue it; it is the deserted mine that has often yielded the greatest treasure, and for the encouragement of such, let me beg those who from want of time or inclination cannot enter their lists, to at least support them by their presence on the eight evenings we devote to the furtherance and advancement of Odontology.

Mr. VANDERPANT exhibited a cast of the lower jaw of a boy, aged 7, showing union between a lateral and a central deciduous incisor.

Mr. CHARLES JAMES FOX showed, for Mr. Walker, a cast of a negro's mouth, in which there was transposition of the lateral and central incisors.

He also showed an upper molar, the fangs of which were hooked at the extremity.

Mr. READ showed two specimens of twin teeth. In the first case, a superior lateral incisor and a supernumerary tooth had been united, but Mr. Read separated them during extraction, which was rendered necessary by overcrowding. In the second case, the union was between the upper central and lateral deciduous incisors: it had been extracted to make room for the eruption of the permanent central incisor. Both these abnormalities had occurred in female patients.

The PRESIDENT remarked that, in his experience, the least uncommon position for twin teeth was that which Mr. Vanderpant had spoken of, viz., union between a lateral and central incisor in the lower jaw.

Mr. READ then read notes of a case of fracture of the right upper central incisor which he had treated in a novel manner. The patient was a boy, aged 12, who had broken the tooth by a fall on his face on the pavement. He had first applied to Mr. Henry Moon at Guy's Hospital, and had been sent by that gentleman to the Dental Hospital for special treatment. The tooth was broken across about $\frac{1}{12}$ inch from the neck, and the pulp was exposed. He first came to the hospital on the 7th ult., and an examination having been made, he was told to come again the next morning, that he might be put under the influence of nitrous oxide and have the pulp effectually destroyed, since the tooth was broken in such a way that it

would have been very difficult to have kept a dressing *in situ* for that purpose. But meanwhile Mr. Read, having thought over the case, had come to the following conclusions,—that in all probability, considering the boy's age, the fang of the tooth was not yet fully developed, and therefore the pulp-chamber would not be closed in, so that the attempt to destroy the pulp and save the root might very possibly end in failure. He therefore adopted the following treatment :—

First, he destroyed the portion of pulp which protruded from the pulp-chamber with pure nitric acid : this caused but little pain. Blood flowed freely from the remaining portion of the pulp, and the bleeding was encouraged by holding warm water in the mouth. He then filed the surface of the stump perfectly flat, and, having slightly enlarged the orifice of the pulp-cavity, he drilled round it a few very fine retaining points.

Then placing a piece of blotting-paper saturated with carbolic acid in close contact with the pulp, he placed on this a layer of osteo, kept in position by the retaining points he had just drilled.

Mr. Read's next consideration was to make and fix, *in situ*, a metal cap to keep the previous one secure, and to make the root useful to bite upon, &c. This he accomplished in the following manner:—He first drilled with a very fine instrument six holes on the broken surface of the tooth, keeping just within the margin of the enamel, and then undercut these with a fine inverted cone drill ; then, using the holes as retaining points, he built up a cap with Dr. Slayton's sponge amalgam as high as possible, without letting the lower incisors bite upon it when the jaws were closed. The boy did not complain of any pain during the operation, nor had he suffered any during the month which had elapsed since. The boy was then brought into the room, and the result of the treatment was inspected with evident interest by the members present.

The PRESIDENT remarked that the case was very interesting, in the first place as an example of what he might term extreme conservative treatment ; the great object was, of course, to

preserve the pulp until the fang was fully developed, and this Mr. Read seemed to have succeeded in doing by his very ingenious plan of treatment. Secondly, the case was interesting on account of the use which had been made of a new material which had been submitted by the inventor with great modesty to the judgment of the profession, and which would, he thought, prove to be useful.

Mr. ASHLEY BARRETT said that Mr. Read's mention of Dr. Slayton's stopping prompted him to ask whether Mr. Read would inform the meeting what success he had met with in the use of this material in other cases. His own experience of it was that it possessed some of the inconveniences of amalgam, without its advantages ; for, whilst it was very soft and apt to become discoloured, it required nearly as much time and labour in working as gold-foil itself.

Mr. READ answered that he had lately used Dr. Slayton's stopping rather extensively, especially in cases which he hoped to be able to watch ; several of the students, for instance, had had teeth filled with it. It was true that the stopping did not keep its colour when used for interstitial cavities, but it only required a little friction to keep it bright, and it was superior to amalgam in this respect, that it did not discolour the tooth. It was not so hard as gold, but it was certainly easier to work ; it was, in fact, very adhesive, and did not require kneading, like gold : whenever the softness was likely to be detrimental, the stopping could be capped with a layer of gold. Of course it was as yet too soon to give a very decided opinion as to its merits, but he thought it would prove useful.

Mr. THOMAS ROGERS said he hoped Mr. Read's patient would not be lost sight of, as he should be glad to hear something of the ultimate result of the treatment adopted. He was not quite sure whether it would not have been better to have extracted the root : he knew that all the books were against extraction, but he had seen two cases in which this course had been followed with advantage. He thought a good deal depended on the direction of the canines : if these were

divergent, it was better to extract the stump, and to bring the remaining incisors together.

Mr. MOON said that in this case it was certainly most desirable to save the stump if possible, for the boy had a very prominent lower jaw, and the falling in of the upper incisors, which would have followed the extraction of this tooth, would have been a source of great inconvenience to him. He also should watch with interest the result of the present treatment. He had suggested, when he sent the boy to that hospital, that the pulp should be destroyed, and a gold tube inserted into the root, on which an artificial tooth could have been fixed by means of a pin. He thought that plan of treatment would have been tolerably safe, but was quite willing to give Mr. Read due credit for the patience and ingenuity he had displayed.

Mr. S. J. HUTCHINSON said he had not as yet used the new filling to any extent in practice, but some experiments which he had made with it out of the mouth did not altogether confirm the statements of the inventor respecting the rapidity and ease with which it could be worked: he had found that it took as long to work as gold; and when finished it was not as hard as gold, or even as osteo.

The PRESIDENT remarked that it was of course necessary to be cautious in expressing one's opinion of new materials; it was very desirable that each should have a fair trial; but cases should be selected in which the result could be watched, and any failure easily remedied. The public could not complain when they tried experiments on their own persons or on students of the hospital. He was himself disposed to think well of Dr. Slayton's stopping, and he would suggest that the very opposite opinions which had been expressed regarding it, must be due to some difference in the mode of working.

Mr. CHARLES TOMES said he had to show an example of dental pathology on a large scale. The specimens he held were balls of secondary dentine which he had taken from the



tusk-socket of an elephant. The tusk had been sent to him to describe by Sir Victor Brook : the fellow to it, which was also in that gentleman's possession, was the largest which had ever been taken from an Asiatic elephant ; it measured nine feet in length, and weighed 120 lb. That which he was about to describe measured only three feet long, but its girth was considerable, and it was heavy in proportion to its size. Its free extremity was abruptly truncated, and ended in a cup-shaped hollow : running backwards along one side of the tusk was a fissure which had healed over. The axis of the tusk was formed of secondary dentine : this was true of all tusks, but normally the amount of secondary dentine was very small, whilst in this case it formed a large proportion of the tusk, and, owing to its comparative softness, was the cause of the cupped extremity.

Just within the socket the tusk was broken transversely, but the fracture was not quite complete : it had not united, but was mended on the inside by the blocking up of the pulp-cavity with a sort of splint composed of secondary dentine ; the rest of the socket was filled up with irregular masses of secondary dentine similar to those now shown.

The explanation of this state of things he took to be as follows :—Many years before the death of the animal this tusk had been broken off at the level of the socket, and the part within the socket had been split.* The animal had, however, recovered from this injury, the tusk had continued to grow, and the longitudinal split had healed. But at a subsequent period the tusk had been broken again just within

* Since giving the above description I have been informed by Mr. G. P. Sanderson, who has had great experience in the capture and care of elephants in Southern India, that at the time of the original accident this elephant must have been quite young, or the whole of the tooth outside the socket would have been solid and without a pulp-cavity, so that the fracture would have led to less disturbance : as the eye of the animal shows it to have attained great age, the duration of the pathological process was the greater part of its lifetime. Inflammation and destruction of the pulp often follows the sawing of the tusks of captured elephants if this be done too near the socket in a young animal.—C. S. T.

the socket ; the animal had lived for some time after this injury also, but it had put a stop to the normal growth of the tusk, these masses of secondary dentine having been produced instead. The case was interesting as showing that the tooth pulp may be subjected to a considerable amount of injury without putting a stop to the formation of tolerably normal dentine ; and again to still further injury, arresting the formation of secondary dentine (*osteo-dentine*).

Mr. THOMAS ROGERS said that the case was also interesting to himself personally on account of the light it might possibly throw on a theory of his own, which, if it should prove to be true, would exercise considerable influence on the treatment of diseased pulp. His idea was that if ever the layer of odontoblasts be injured, no fresh dentine could be formed, since no second layer of odontoblasts ever appeared. Could Mr. Tomes give him any information on this point ?

Mr. TOMES answered that he was sorry he could not. The specimen, unfortunately, had not been presented to the Museum, —it had only been sent to him for description ; he had therefore only been able to make a superficial examination, and could not cut any sections.

The PRESIDENT then handed round a model showing two supernumerary teeth situated close to the incisors, and resembling malformed bicuspid or molars.

He also showed an apparatus which he had had constructed for the administration of gas and ether : it was an improvement on a similar apparatus which he had exhibited to the Society two years ago. He did not claim any great novelty in the arrangement, but thought it would be found compact, convenient, and efficient.

After the usual vote of thanks the meeting terminated.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE following applications for Membership have been received by the Council.

STORER BENNETT, L.R.C.P., London, M.R.C.S.E., L.D.S.
G. C. DABOLL, D.D.S., Paris ; Buffalo, New York, Non-resident.

T. G. T. GARLAND, 2, Stafford Villas, Heavitree, Exeter,
Non-resident.

JAMES MERSON, L.D.S., 35, Harley-street, W.

ORDINARY MONTHLY MEETING,

March 4th, 1878.

ALFRED COLEMAN, Esq., PRESIDENT, IN THE CHAIR.

THE Minutes of the previous Meeting having been read and confirmed, the following gentleman was proposed for election :—

EDWARD THOMAS PAYNE, 2, Sussex-place, Southampton,
Non-resident.

The following gentlemen were then balloted for, and elected Members of the Society :—

GEORGE AUGUSTUS COURTENAY BENHAM, 155, Woodhouse-lane, Leeds, Yorkshire, Non-resident.

CHARLES SIBTHORPE BRIGHT, 14, Via Assarotti, Genoa, Italy, L.D.S., R.C.S.E., Non-resident.

JOHN LAWS, 125, St. George's Road, Bolton, Non-resident.

Mr. GADDES then read the following account of a case of Hysteria, with unusual symptoms, which had occurred in the practice of Mr. J. R. Garner.

Miss E. H., aged 21, had for some time been suffering acutely from toothache, principally located on the left side and in the upper premolars. As she was in very delicate health, having only recently recovered from scarlatina and diphtheria, I was anxious, if possible, to avoid extracting the teeth, and therefore from time to time applied various anodynes to the

carious surfaces, at the same time advising her to seek in change of air a means of restoration of her general health. However, these means in no way availed ; the pain in the teeth continued, depriving her of rest, and altogether aggravating the debilitated condition of her system. She therefore came to me on the 14th April, 1875, stating her resolve to have the posterior tooth extracted, and expressing a wish to have nitrous oxide for that purpose. Her medical attendant was unable to accompany her, owing to numerous engagements, but he had expressed an opinion to her that she might safely take chloroform, and he would have no hesitation in administering it. My gas apparatus happened to be out of order, but wishing to save her the pain and apprehension of the operation, I consented to administer a little bichloride of methylene ; I did this the more confidently after the opinion expressed by her medical man. All being in readiness, I measured out half a drachm of methylene (a quantity I had frequently used successfully before), poured it on the flannel bag with which the leather inhaler of that apparatus is provided, and requesting the young lady to breathe calmly and steadily, I applied it (the inhaler) over the nose and mouth. She instantly dashed it away, saying she could not breathe. I said a few words to reassure her, and again applied the inhaler, and she immediately removed it. On advising her to try once more, and endeavour to overcome her fears sufficiently to fall slightly under the influence of the drug, she submitted, and inhaled steadily for a few seconds, her pulse beating regularly the while. Finding her sufficiently insensible, I removed the tooth very easily, the fang being decidedly stunted. She at once leant forward, and with my help rinsed her mouth out with water two or three times in quick succession. I then suggested she should lie back in the chair and quite recover herself. I now noticed her eyes had a fixed expressionless stare, and her breathing became laboured. Her hands were pressed on her bosom, and on asking her how she felt, she replied that she felt "a fearful oppression on her chest." I then asked a young lady (her cousin), who accompanied her, to loosen all her clothes as much

as possible, and freely sprinkled her face and chest with cold water, and applied ammonia to her nostrils. Her respiratory efforts became more and more spasmodic, and her eyes retained their fixed stare. We then removed her to a couch in an adjoining room, but on her attempting to lie down, she instantly started up exclaiming, "I must breathe ! I must breathe !" Finding no efforts on my part of any avail, and beginning to be anxious about her condition, I sent off for her medical man : he was away from home, but his brother-in-law, also in practice, was quickly in attendance. I explained in as few words as possible the nature of the case. Dr. Way administered a little sal volatile in water ; but the spasms increased in intensity, and the peculiar sound of the inspirations was painful to listen to. Cold water was again applied, her face and chest flicked with a wet towel to rouse her, but without any effect. Dr. Way then applied the stethoscope, and found the spasms proceeded entirely from the throat, the heart being quite uninfluenced. A very small quantity of nitrate of amyl was applied on a handkerchief for her to inhale. But all attempts to restore her met with resistance, and they only seemed to increase her distress. She was then supported between two of us, and walked up and down a garden, and that appeared to have an improving effect on her, but she quickly relapsed ; another fit of laboured breathing came on : she dragged the rings off her fingers, throwing her body about in her efforts to breathe, and she became wandering in her mind. After two hours and a half spent in fruitless endeavours to restore her, Dr. Way decided on taking her home during a lull in the attack. A closed conveyance was obtained, and the Doctor, patient, and her cousin went in it. My services would have been of no avail, so I did not accompany them, but I obtained the other particulars from the doctors and parent. In the carriage she was somewhat violent. Arrived at her parent's house, she was assisted inside, and at once intimated by signs that her room should be straightened. Beyond this she took little notice of her relatives, but went up to a photograph suspended on the wall of the sitting-room—a portrait of a lady friend—and inti-

mated her wish to have her sent for at once. That lady soon arrived, had no difficulty in controlling her, and she succeeded in getting her to bed. Miss E. H. told her friend in half-sentences, and with her voice not raised above a whisper, that during the operation she knew all that was going on, and also subsequently, and felt if she could only cry she would be all right. Dr. Way administered hydrate of chloral, and finding it have effect, left her for a short time. He returned after a few hours, accompanied by her regular medical attendant, Dr. Campbell. They then administered a further dose of chloral under much resistance, which seemed to produce no effect. The breathing continued in the same distressing condition, the eyes retained their glassy stare, and the mind was painfully alive to every sound. Every knock or ring at the bell, every footstep in the passage brought alarm with it, and caused her to spring out of bed and cling to the nearest support with a strength which was surprising, considering her otherwise prostrate condition, at the same crying out to take the man away, she would not have her tooth out. As the night advanced, the symptoms became more unfavourable, the hitherto good pulse became wavering and scarcely perceptible; the extremities became cold. During the night the chloral produced two hours' sleep, but she awoke in the same semi-unconscious state. When the doctor visited her the next morning early, he found the breathing natural again, but she did not seem to recognize those about her, except the lady friend above referred to. A little nourishment was administered with difficulty. She slept three hours, and also slept fairly that night, but the following morning showed no further improvement in her condition, and grave doubts began to be entertained of the issue. However, during the afternoon of that day there was evidence of improvement. Perfect consciousness returned, and she gradually improved until the following morning, four days from the day of operation. But her voice had gone, and all her utterances were in the faintest whisper, and she had quite lost the use of the lower extremities. Her general health so far improved that in three weeks after she was brought to

me for the purpose of having the remaining premolar extracted, as it affected her rest and helped to retard her recovery. She had to be carried from the carriage to my room, or rather so supported on either side that it was evident she had no power of her legs. I had to place my ear close to her mouth to catch the sound of her faintly whispered remarks. The tooth was extracted without any unfavourable circumstance, and no anæsthetic was used. She went away for change of air, and by slow degrees regained the use of her lower limbs, improving in strength as well; but no improvement was observed in her voice, which continued the same, until one day, six weeks after the event recorded, it returned to her suddenly and completely.

Mr. GADDES said he thought the case one of considerable interest, inasmuch as the phenomena, if they were purely hysterical, were certainly uncommon. The cause of the aphonia and paraplegia might be somewhat obscure, but it was well known that injury is usually succeeded by a period of depression of all the vital functions, and this may either end in death, pass into a state of excitement, or gradually disappear. In this case the patient was semi-anæsthetized; in which condition there is also partial paralysis of the vaso-motor nerves, and the action of the heart is enfeebled. A painful impression received under these circumstances not unfrequently destroys the power of the already partially paralyzed vaso-motor nerves, causing the great abdominal vessels to dilate, and to become so gorged that little or no blood reaches the heart. Thus from shock received while the vital functions are much depressed, is cessation of the heart's action, and death liable to take place. These results were carefully worked and published by Dr. Lauder Brunton, and the lesson to be gained from them, and from this case also, was, that it is much safer to have the patient thoroughly anæsthetized during any operation, rather than give a small dose of an anæsthetic, as he feared many practitioners were liable to do.

The PRESIDENT remarked that the case was interesting as an example of what any of the members present might at any time be called upon to deal with. Cases of Hysterical Mania, such as this evidently was, were certainly rare, but no dentist could be in practice for a few years without meeting with several differing from this only in degree. He could not agree with Mr. Gaddes in thinking that the administration of too small a quantity of methylene was the cause of the attack, for precisely similar symptoms had occurred in cases where no anæsthetic had been used ; he should rather ascribe it to the shock of the operation acting on the over-sensitive nerves of a delicate girl whose strength had been reduced by previous ill-health and long-continued pain. As to the treatment of such cases the great point to be remembered was that the slightest appearance of sympathy was bad for the patient ; she must be commanded with firmness and decision, and her whims must on no account be given way to. It was however necessary to make sure first of all that the case was really one of hysteria, and it was sometimes a little difficult to distinguish the hysterical symptoms from those due to more serious causes.

Mr. VANDERPANT said, that in the course of ten years of practice he had met with several cases in which hysterical symptoms had supervened after the administration of nitrous oxide gas. The most serious was that of a young lady aged twenty, to whom he gave gas to facilitate the extraction of some molar stumps. She had not previously shown any symptoms of hysteria, but immediately after this operation she became most violent, and screamed without cessation for upwards of two hours. Fortunately she had brought her medical attendant with her ; this gentleman particularly insisted on the importance of firmness in dealing with the patient, but his firmness had not much effect, for it was only after she had lain for three hours on the floor of his anteroom, had made a great deal of noise, and had been liberally drenched with cold water, &c., that she recovered sufficiently to be removed to her home : she afterwards stated that she had felt no pain whatever during the removal of the stumps.

Mr. ASHLEY BARRETT suggested, in reference to the difficulty in the diagnosis of which the President had spoken, that a knowledge of whether the patient were married or single would be of some assistance ; if the patient were single, the presumption would be in favour of hysteria ; if married, then rather against that view.

Mr. CLAUDE ROGERS exhibited a lamp which he was in the habit of using whenever he was compelled to work by artificial light. It consisted of a glass globe filled with water, one of those commonly known as "jewellers' globes," supported on a sort of tripod, and behind this was a jointed gas-bracket movable in all directions. A beautifully white light could be obtained by adding a little sulphate of copper to the water, and its intensity could be increased by fixing a reflector behind the gas jet.

The PRESIDENT said he had seen a very similar apparatus, some years ago, in the possession of Mr. Gibbons, of Brighton, and he believed that was a copy of one belonging to Mr. Woodhouse. A bowl of water with a candle behind it was often used by lacemakers. He trusted that the younger members of the profession would not be tempted by the use of such contrivances, to work too many hours at a stretch : he thought that working by artificial light, if persisted in, would be found very detrimental to the sight.

Mr. HUTCHINSON thought that all arrangements for concentrating the light were a mistake. In the first place the strongly marked shadows thus formed were very objectionable ; and in the second, heat was concentrated as well as light. This last drawback could be obviated by using a saturated solution of alum instead of pure water. He himself much preferred a good diffused light : they found a diffused light best in the daytime, and the object should be to get as good an imitation of that as possible. He found a Silber gas-burner answer the purpose best ; it gave a very steady, white, diffused light.

Dr. FIELD said he strongly objected to working by artificial light, and only did so under exceptional circumstances. But he did not share Mr. Hutchinson's partiality for diffused light ; even in working by daylight he preferred the direct light of the sun to the diffused northern light in which most operators delighted. For the first ten years of his practice he had occupied a room with a northern aspect, for the last five he had occupied one looking south, and he found this far preferable. The south light was steadier under all conditions of atmosphere, and on obscure days, which were sufficiently numerous in this climate, it was often possible to work in a south light when it was impossible to do so under a northern aspect. In working by lamplight he did not reflect the light directly into the cavity, but indirectly by means of a mouth mirror, and he thus got rid of the dark shadows which Mr. Hutchinson had found so troublesome ; but if gold had to be used, the reflection from it was very trying to the eyes, and this could not be obviated.

The PRESIDENT said, that in these matters a great deal depended upon habit. One of his friends always worked with a south-west aspect, and the fact that an additional twenty minutes of daylight per diem were thus gained for six months in the year was worthy of consideration.

The PRESIDENT then called upon Mr. Charles Tomes to read his paper.

*On some forms of Dentine Calcification, with Notes
on their bearing on Dental Pathology.* By
CHARLES S. TOMES, M.A.

To the end that our observations and searchings after truth may be fruitful and yet not wasteful of labour, it is essential, from time to time, to map out the boundaries of our knowledge, and, with no less exactitude to define the areas of our ignorance. Such is the purpose of my paper : I have little that is absolutely new to offer, almost nothing that has not been published elsewhere ; I can only hope to put forward, as clearly as in me lies, a few matters for thought, for discussion, and—what is a hundredfold more worth than either—for observation.

But as some of the most significant facts of dentine development have been too recently published to be generally known or to have found their way into text-books, I must briefly describe the several methods in which healthy dentine is built up.

To take first ordinary hard unvascular dentine, such as we know in the human tooth.*

* A much fuller account of the varieties of dentine and their development is contained in a paper by the author,

It was formed by the calcification of a specialised layer of cells,—odontoblasts upon the surface of a pulp. The pulp, vascular and nervous, is encroached upon by this calcification proceeding inwards from its surface on every side; and as the odontoblast layer creeps inward, so do the vessels and the nerves (the large ones at all events) recede inwards before it.

So that when the dentine is complete it contains no bloodvessels, no large nerves; nothing soft but the axial portions of the odontoblasts, which persist as the dentinal fibrils.

With this we may compare the development of typical vaso-dentine.

At the outset there is an exactly similar dentinal pulp; a richly vascular* papilla, the capillary plexus of which is but little beneath its surface, which latter is clothed with an odontoblast layer. Calcification takes place in the odontoblasts, and the odontoblast-layer creeps inwards, but in place of the capillaries receding before it, they remain in position, and become enclosed in the calcifying dentine. Here they remain pervious, and red blood circulates freely through them, just as it did when they formed part of a soft papilla.

In other words calcification has gone on right “on Vascular Dentine” (*Philosophical Transactions of the Royal Society*, 1878).

* Nothing is known of its nerves.

up to the capillary, so that it has no pulp-tissue around it, but lies in a bony channel of the same calibre as itself.

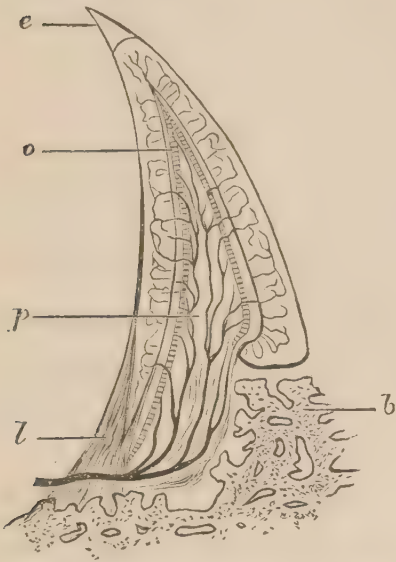


Fig. 1. — Longitudinal section of a tooth composed of Vaso-dentine (Hake) somewhat diagrammatic.

- b*, Bone of jaw.
- e*, Tip of enamel.
- l*, Ligamentous hinge by which it is attached.
- o*, Odontoblast layer.
- p*, Richly vascular pulp.

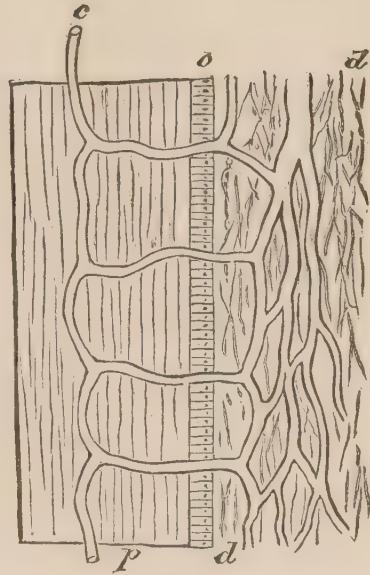


Fig. 2. — Section of Vaso-dentine more highly magnified (from Hake).

- d*, Dentine containing no dentinal tube.
- o*, Odontoblasts.
- p*, Pulp, from the larger vessels of which capillaries (*c*) pass into the substance of the dentine.

In typical VASO-DENTINE no dentinal tubes exist, for calcification goes on in the several odontoblasts to the entire obliteration of any axial channels. But there are many intermediate forms of dentine between typical unvascular dentine and typical Vaso-dentine; thus in the flat fishes the apex of the tooth is hard dentine, merging by degrees into vaso-dentine at the base, the den-

tinal tubes becoming fewer, and finally absent, while vascular canals begin to occur.

Among mammals the great extinct *Megatherium* had a rich capillary plexus in the dentine; while the Manatee and Tapir have regular but scanty vascular channels in their dentine.

There is yet another variety of dentine, termed *Plici-Dentine*, in which an appearance of much complexity is arrived at by foldings of the odontoblast-layer of the pulp; but the difference between this and ordinary hard dentine is more apparent than real.

In Hard Dentine, Vaso-dentine, and Plicidentine, which we may term the true Dentines, we have this in common; the hard structure is a product of calcification of a superficial, highly specialised layer of cells,—the odontoblasts.

But in the next variety, *Osteo-Dentine*, there is a great and radical difference. Like the others, it commences by the formation of a thin skin of calcification on the surface of the papilla; but here the resemblance ceases. From the interior of this first skin there shoot down throughout the papilla calcifying processes, which inosculate with one another. By these is the body of the tooth formed, and a specialised odontoblast-layer has nothing to do with it. So that we can pull out the pulp from a hard dentine tooth, or a vaso-dentine tooth, at any period of its growth; but you can-

not pull it out of an osteo-dentine tooth, save at the very first, because calcification has shot through and through it.

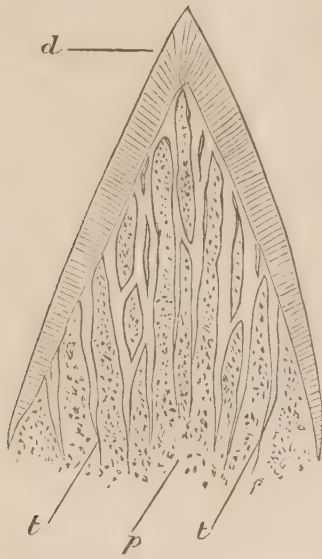


Fig. 3.—Section of an osteo-dentine tooth (Pike) with the pulp *in situ*.
d, Shell of hard dentine.
p, Pulp-tissue.
t, Trabeculae of ossifying material shooting down the rough pulp.

From the foregoing very brief account it will be seen that the formation of osteo-dentine has little in common with that of other or true dentines; nevertheless these divergent forms of calcification may occur in one and the same tooth-pulp, as is exemplified in the teeth of the sheep's-head fish (*Sargus ovis*), in which, after the formation of an upper half of hard dentine, a basal portion of osteo-dentine is developed from and in the same pulp.

There is yet another form of calcification of dentinal pulps,—that in which globular masses,

more or less completely aggregated together, are produced.

Of the details of this process we know absolutely nothing; it is the means by which the pulp-cavity is finally occluded in such creatures as the Sperm Whale; it is known to occur in injured pulps of creatures in which it is otherwise abnormal, and it occurs in pathological growths.

The relation of globular calcification to normal dentine development is beautifully illustrated by the tusk described by me at the last meeting of the Society. There an injured pulp struggled on, producing what was not normal, but yet was a fair similitude of a normal tusk in outward appearance; it receives a second injury, and can do no more thenceforward than form a number of isolated globular calcifications, many of them as large as a swan's egg.

And it must not be forgotten that these globular calcifications differ more in size than in kind from calcospherites, which can be artificially formed, out of the body.

It would seem, then, that we might place these several forms of calcification of dentine pulps in a scale, passing from hard dentine as the highest, through vaso-dentine and osteo-dentine to globular dentine as the lowest and least specialised.

This is in some degree borne out by what we find in such morbid growths as odontomes; in

these I have found vaso-dentine differing from the normal dentine only in so far that capillary tracts persisted in it; then beyond that, farther from the normal tissues, osteo-dentine, and beyond that again globular dentine.

In other words, the tissues produced as morbid structure in the human tooth are normal structure in certain other teeth;—like the famous definition of dirt, they are merely matter in the wrong place.

When, in excavating a cavity, we expose a living and fairly healthy pulp, we cover it in, and, did we but know how, should take measures to induce its calcification at that point; on the other hand, when a patient comes to us suffering neuralgic pain traceable to a sound tooth, we, after excluding certain other possible causes, say that it is due to a calcifying pulp. Now, wherein lies the difference between this beneficent calcification we pray for, and the maleficent calcification we know not how to combat?

Here is a lack of data; we need observations upon the pulps of teeth that have been painless, and upon those that have been painful, carried out with strict accuracy and attention.

As a suggestion, as a mere starting-point for observation, something to this effect might be put forth.

When calcification takes place normally in the

odontoblast-layer, the vessels and nerves recede before it, so that they cannot become involved in it; when, however, calcification, deserting the odontoblast-layer, appears more deeply in the pulp, as it often does in the form of globular calcifications, it is likely that nerves and blood-vessels, which have not receded before it, as in the other case, would be implicated by it, and pain result.

Now, there are very good grounds for believing that normal odontoblast calcification is a process easily upset, and that odontoblasts once destroyed on the surface are not readily reproduced, if they are at all; and if the above suppositions be true, they have a bearing upon the treatment of cases of exposed pulp.

For if odontoblast calcification be the only thing that is useful to our purpose, then that copious sponging of the point of exposure with undiluted carbolic acid, which I suppose all of us have practised with some assiduity, was labour very much misapplied, for carbolic acid coagulates the albumen and shrivels up the odontoblast, tanning it and rendering it incapable of further development. In fact, if my hypothesis be true, in exact proportion to the efficacy of our application will be the mischief we have done.

On the other hand, if any form of calcification that will block the hole will be painless and

answer the purpose equally well, then we need consider nothing but the patient's comfort at the moment, and use any remedy we please, in the confidence that slight maltreatment of the exposed pulp will do nothing worse than induce a lower and ruder form of calcification.

In my own practice I have lately met with a case of severe neuralgia, especially affecting the occipital region, which was caused by globular calcification of the pulp of an upper molar, which had gone on to such an extent that there was but little room for pulp-tissue left; yet the few threads remaining were sufficient to cause intense neuralgia; and to remove all doubt as to the correctness of the diagnosis, I may add that this has happened to two teeth in the same mouth within a year with precisely the same result.

The teeth were not extracted, the remnant of pulp having been destroyed by numerous dressings of arsenious acid, and the globular masses, which were loose, but roughly fitting the pulp-cavity, got out with no small trouble.

To recapitulate, it is my belief that calcification going on in the odontoblast-layer to any extent will probably be painless, for the nerves will, as in ordinary dentine growth, recede before its advance; on the other hand, globular calcifications starting deep in the pulp and in tissue-elements other than the odontoblasts, are likely to press

upon nerves, and so cause pain; these globular masses being practically foreign bodies in the pulp. It would take long to determine this point by the cases which fall under the observation of an individual, but if a dozen of my hearers would for a year take every opportunity of making observations, my hypothesis would be either negatived or confirmed.

To turn to another subject, it is a matter of well-grounded belief that the dentinal fibrils may, under certain conditions of irritation, become calcified, so rendering the dentine solid and homogeneous. This is believed to happen when a surface of dentine has been for a long time denuded of its enamel coat, or, in favourable cases, after caries has been polished away.

It is believed also to happen in that transparent zone which intervenes between caries and the pulp-cavity, though there are points in reference to this not yet thoroughly cleared up, and which can only be cleared up by very minute and very troublesome investigations. But a little light is thrown upon the subject in an indirect way by the structure and development of typical vasodentine.

In this, as I have before remarked, the pulp is coated by odontoblasts just like those of a human tooth-pulp, but instead of the axial portions remaining uncalcified as dentinal fibrils, the whole

thing calcifies, and the dentine produced is an impervious mass, with no tubes in it.

This impervious dentine forms the exterior of many teeth, and has no enamel coat to protect it. As a curious instance of compensation, not wholly germane to my subject, I may mention that the vaso-dentine tooth of the trunk-fish (*Ostracion*), which is peculiar in having its capillaries very close to the surface, leaving no room for an impervious layer of any thickness, has a thick coat of enamel instead.

To my mind, the probability of calcification occurring in the human dentinal fibril, and so solidifying the dentine, is heightened by the occurrence of solid dentine in a large number of fish, the formative organs (odontoblasts) being to all appearance quite similar in the two cases. But probability is a very different thing from proof, and I am painfully aware that my paper proves nothing at all. But if I have done ever so little in the way of showing that a favourite study, that of comparative odontology, is capable of offering hints and suggestions for thought to practical men, and so rescuing it from the charge of having no real usefulness save as a mental exercise, I shall be well content.

DISCUSSION.

The PRESIDENT said that the truly interesting paper which he had just heard had taken him rather by surprise. Mr. Tomes had undertaken, at short notice, to fill a gap in their arrangements ; and although he felt sure, when he came down to the meeting that evening, that he would hear something worth listening to, he was scarcely prepared for the long, original, and highly suggestive paper with which Mr. Tomes had favoured them, and he felt at a loss to decide as to which of the many practical suggestions it contained it would be best to dwell upon. He noticed that Mr. Tomes had adopted Kölliker's observations respecting the formation of dentine. There was one point in connection with this on which he should be glad of some information—did the growth of the dentine proceed from one layer of odontoblasts, or from a succession of layers? Mr. Tomes' explanation of the mode of formation of vaso-dentine appeared to him to be original,—certainly it was the best he had met with. The account of the formation of secondary dentine differed slightly from that generally given, but was very clear and satisfactory.

Mr. GADDES said there were two points in Mr. Tomes' paper on which he should be glad of some further information. In the first place he had spoken of the vessels and nerves getting out of the way of the odontoblasts: could Mr. Tomes tell him how this took place? Secondly, Mr. Tomes had stated that the islands of calcification which were sometimes found in the pulp-cavity caused pain by their mechanical pressure on the nerve-filaments. But if this bone was merely a conversion of pre-existing tissue, and not a new formation, he did not see why it should interfere with the nerve-filaments: did Mr. Tomes think that the deposit of calcareous matter in the tissue was accompanied by increase of bulk?

Mr. WHITE said he was glad of an opportunity of thanking Mr. Tomes for his able paper, to which he had listened with the greatest interest. He could quite confirm the statement of Mr. Tomes that calcification of the pulp might be a cause of pain. His attention had been called to this fact by a case he had met with in practice some years ago: he believed the tooth was still in the Museum. A patient came to him complaining of acute pain in a lower bicuspid; the tooth itself was sound, but was much crowded upon by its neighbours. Thinking this might be the cause of the pain, he relieved the pressure by filing between them. But the pain continued as bad as before, and at last he was compelled to extract the tooth. On filing a small groove, and then splitting the tooth, he found that the pulp-chamber was almost filled by a mass of calcification. The patient had no return of the pain. It was evident that these islands of calcification might cause pain, but he should be sorry to assert that they always did: in temporary teeth, at all events, it was very common to find masses of amorphous calcification when there had been no history of previous pain. He could also indorse what Mr. Tomes had said respecting the effect of strong carbolic acid on the odontoblasts: when applied under the microscope, it would be seen that the acid shrivelled them up, and made them very transparent. He thought, however, that the acid might be used so far diluted as to be still capable of preventing septic action, and yet not be strong enough to destroy the vitality of the cells, and thus to put an end to all chance of subsequent calcification. Practically it was but seldom that the whole thickness of the dentine could be removed without some injury being done to the superficial layer of the pulp. When the cavity was out of sight on the distal surface of a tooth, this was almost certain to occur, and then he thought it was best to use the acid strong, since it would not only act as an antiseptic, but as an anæsthetic also. The extremely sensitive nature of this layer was shown by the fact that even in cases where the pulp was not exposed, but where a thin layer of dentine had been left between it and the stopping, the patient was very apt to complain of pain being

caused by the sudden application of heat or cold, or even by changes in the weather: this was, of course, due to the fact that the metal was a better conductor of heat than the dentine was.

The PRESIDENT observed that Mr. Tomes had shown in his paper that secondary dentine might be formed independently of the odontoblast-layer; possibly, therefore, the partial destruction of this layer might not always put an end to all chance of calcification taking place. Still, the occurrence of calcification under these circumstances must be exceptional, because they knew that practically it was no use attempting to cap in any of the cases of old exposure of the pulp which so often came before them, where the odontoblast-layer was evidently gone.

Dr. FIELD said he had for some time past abandoned the use of strong carbolic acid and creosote as an application to exposed pulp before capping, because he found that all the cases so treated failed; the tooth became painful, and sooner or later he had to extract it. But with dilute carbolic acid he had obtained good results. In cases where the cavity was out of sight, on the distal side of the tooth, he never used an excavator, since, as Mr. White had remarked, it was very apt to slip and do harm: he always used a burr worked by the engine, and when he approached the pulp-cavity he put on a very fine gold finishing burr: the amount of force and the point of application could thus be regulated with the utmost delicacy and exactness.

Mr. OAKLEY COLES thought it would be impossible to discuss Mr. Tomes' paper satisfactorily in the short time at their disposal that evening: it was besides a paper which required and deserved careful reading and consideration. He would propose, therefore, that the discussion should be adjourned until the next meeting of the Society. In the interval members would have an opportunity of trying some experiments in order to ascertain what really was the action of carbolic acid on the odontoblast-

cells, and at what strength it might safely be used. This was indeed such an important point that he thought the best course would be to appoint a sub-committee specially to inquire into this subject, and to ascertain whether all other antiseptic agents, such as salicylic acid, thymol, &c., act in the same way, or whether any of them might possibly act as a stimulant to bone-formation.

The PRESIDENT said, that in his experience to appoint a sub-committee to inquire into a subject was almost synonymous with burying it. As to the adjournment of the discussion, he was ready to do as the majority of the members wished, but he thought that adjourned discussions had often turned out failures. He quite agreed that the paper deserved to be carefully read and thought over. It contained indeed enough original matter to furnish several papers, and he hoped that Mr. Tomes would, on future occasions, elucidate some of the many points of interest which he had only touched upon that evening.

Mr. ASHLEY BARRETT said there appeared to be considerable diversity of opinion respecting the best mode of treating an exposed pulp. The advice which had been given to him was the following : if any hæmorrhage should take place from the pulp, it had better be destroyed if it did not bleed, an attempt might be made to save it, but the prospect was not very favourable ; in many cases pain would supervene, and the attempt would fail. His own experience had been quite in accordance with this expression of opinion.

The PRESIDENT then called upon Mr. Tomes for his reply.

Mr. TOMES said he quite agreed with the President that adjourned discussions generally fell very flat, and he felt obliged to him for having expressed himself against that proposition. He was sorry to say that he could only answer some of the queries which had been addressed to him ; the others must wait the results of future investigations. Mr. Gaddes had found a difficulty in accounting for the interference with the nerve-filaments which seemed to be caused by calcification

of the pulp. He himself could not altogether account for it, and therefore he had made no positive assertion on the subject. What he had suggested was this, that as the form of calcification departs from a high and approaches a lower standard, so are we more likely to have mechanical interference with nerve-function. But though several facts seemed to point to this conclusion, he had no positive proof of its truth. Mr. White was surprised that the islands of calcification so often found in the temporary teeth seemed to cause no pain; but he must remember that the pulp of these teeth might be freely exposed without pain being felt: it was indeed much less sensitive than the pulp of the permanent teeth. The President had remarked that although calcification might occur in any part of the pulp, yet experience showed that it was no use capping old exposures on the chance that calcification might take place: this went to confirm the opinion he had expressed, that the normal mode of formation of dentine was the only useful form, *i.e.* from the odontoblast-layer. He had seen a plan of treatment advocated in an American paper, and he believed it was a favourite plan with some practitioners, of touching slight exposures of the pulp with strong nitric acid: an eschar forms, and they cap over this. If this treatment was successful, that was, if benign calcification resulted, his theory was demolished.

The PRESIDENT said he had been in the habit of occasionally using nitric acid in this way and with good results. The effect of the acid was to form a thin film on the surface of the pulp, leaving the part beneath quiet and healthy, but he had no proof that calcification had ever taken place after this treatment.

After thanking Mr. Tomes and other contributors, the President called attention to some excellent specimens of bone-work with natural teeth which had been made in Paris as recently as 1872, and which had been sent for exhibition by Mr. Hepburn.

The meeting then terminated.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE following applications for Membership have been received by the Council.

RICHARD BRADSHAW, 41, Great Marlborough-street, W.,
Resident.

J. C. FORAN, Marshfield House, Eastbourne, Sussex, Non-
resident.

GEORGE HOCKLEY, 45, Great Marlborough-street, W., Re-
sident.

WILLIAM WEST, 9, Ackerman-road, Brixton, Resident.

J. W. WORSTER, 27, Newington-crescent, Kennington-
park-road, Resident.

ORDINARY MONTHLY MEETING,

April 1st, 1878.

ALFRED COLEMAN, ESQ., PRESIDENT, IN THE CHAIR.

THE Minutes of the previous Meeting were read and confirmed.

The following gentleman was balloted for and duly elected a non-resident member :—

EDWARD THOMAS PAYNE, 2, Sussex-place, Southampton,
Non-resident.

The PRESIDENT announced that the Council, in consideration of the fact that new materials for filling teeth were constantly being brought under the notice of the profession, and that these greatly varied in value, had appointed a Committee, whose duty it would be to have analyzed and otherwise investigated the properties of such compounds, and a sum of money would be placed at its disposal to enable it to carry out any experiments that might be necessary. The following gentlemen had been selected for the work : Messrs. Chas. Tomes, Hutchinson, Woodhouse, jun., and Gaddes. They would first examine the fillings which had recently been brought forward by Messrs. Slayton and Poulson, and would be very glad to receive communications from gentlemen who had any special knowledge of the composition of these substances or of the best modes of working with them.

Mr. ASHLEY BARRETT then read a communication on "Periodontitis, resulting from Devitalization of the Pulp by Arsenic." In a paper recently read before the Society he had

remarked that periodontitis might result from, and did sometimes follow, the use of arsenic. Two such cases had lately come under his notice, and as they presented some points of interest, he would briefly describe them. In the first case he opened the pulp-cavity of a lower left second molar with the dental engine. Arsenic was applied and kept *in situ* by a temporary osteo filling. In a few days the patient returned, having suffered severely in the interval. The tooth was very tender, and there was an ulcerated patch on the margin of the gum on the opposite side of the tooth to the cavity. The tenderness and ulceration increased, and in a few days the tooth had to be removed. After extraction the cause of the trouble was clear ; the drill had, after entering the pulp-cavity, penetrated the wall on the opposite side at a point where it was frequently very thin, viz., at the lower part of the pulp-cavity, near the junction of the two fangs. Through this opening, which was very minute, the action of the arsenic had extended, and had produced very severe periodontitis. He quoted the case because it illustrated his previous paper, although he feared that his reputation as a skilful operator would not be improved by the occurrence of such an accident.

In the second case he opened the pulp-cavity of an upper first molar in a girl aged 15. The application of arsenic was followed by great tenderness in the neighbourhood of the tooth. Three days afterwards he removed the stopping and thoroughly syringed out the cavity ; but the pain continued to increase, and after a few days he was obliged to extract the tooth. On splitting the tooth open he found the pulp very congested, and apparently recently deprived of its vitality. It had not the least odour of decomposition. The openings at the ends of the fangs were of course patent, but not very large. His opinion was, that the destructive inflammation caused by the arsenic did not cease at the ends of the fangs, but extended beyond and set up severe periodontitis. Such cases were rare, but they did now and then occur. Not unfrequently a tooth became somewhat tender after the application of arsenic, but he had generally found that the tenderness subsided in a few days:

He had observed that this extradental action of arsenic was not always confined to very young teeth, in which, on account of the large openings at the fang ends, one would be prepared to expect it. He should be glad if any light could be thrown upon these cases. Was there any means of judging before using the arsenic whether there was any probability of periodontitis resulting from its action?

Dr. FIELD then exhibited a set of instruments for use in cases of Rigg's disease. The prominent feature of this disease was the formation of a hard green tartar round the margin of the teeth, which gradually extended into the socket down to the roots. Inflammation was set up in the alveoli, and a purulent discharge was established, the teeth became loosened, and at last dropped out. The treatment consisted in the complete removal of the tartar from the tooth and alveolus. The gums were then well syringed, and aromatic sulphuric acid, either strong or dilute, was freely applied, and finally a weak solution of carbolic acid and iodine. He had previously used Howe's scalers, but found Rigg's instruments much more convenient and efficient. The treatment was of course somewhat severe; it caused a good deal of bleeding and pain at the time, and some soreness afterwards; but the result was very satisfactory. In a case he had lately been treating fourteen teeth had been doomed by six practitioners, but all were saved except three. It was very important that every vestige of tartar should be removed, and also that the local application should be applied as far as the disease extended, to the apex of the roots if necessary. For this purpose he used a thin stick of orange wood, cut to a point. In bad cases when suppuration had become established, it was necessary to cut away the inflamed and diseased margin of the alveolus. As a rule, three sittings, at intervals of a week or ten days, were sufficient to effect a cure.

Mr. CHARLES TOMES, in answer to a question from the President, said that the pathology of the disease seemed to him too important to be disposed of in a few minutes, as a casual com-

munication. It was, in the first place, an open question whether the tartar was not a symptom of the disease, instead of being the cause of it. He believed that the Council had under consideration a plan of proposing set subjects for discussion, and he would suggest that this should be one of them. He would therefore content himself with confirming Dr. Field's opinion of the treatment by means of these instruments. In the few cases he had treated with them he had met with an unexpected amount of success.

Dr. FIELD then exhibited an improved form of annealing lamp.

Mr. CHARLES TOMES then showed a specimen presented to the Society by Mr. Richardson, of Derby. It was an upper molar, the roots of which were coated with a thin layer of bone



with a rough surface. The tooth appeared loose before extraction, and came out very easily. The inner wall of the alveoli, *i.e.* that which is in immediate relation with the root, was formed by a thin layer of dense bone, then came a layer of loose spongy cancellous tissue, and then dense bone again which forms the exterior of the jaw: in this case this inner shell of bone had come away with the tooth as a sort of sequestrum, though it had not the ordinary appearance of dead bone.

The PRESIDENT suggested that it might be a case of ossified periosteum.

Mr. TOMES said that he had not yet made a microscopical examination, but he thought the explanation he had just given accorded best with the naked eye appearances.

Mr. CHARLES JAMES FOX exhibited for Mr. Phillips, of Liverpool, a model of the mouth of a patient, aged 26, a native of Venezuela, 5 feet 2 inches in height. The upper model, which was no larger than that of a baby's, showed four incisors

of the supernumerary type; there were no canines or bicuspid, and only one imperfectly developed permanent molar on each side. The lower model had unfortunately been lost, but the patient had no teeth in this jaw except two molars. As might be supposed, the patient had a very peculiar expression of countenance. He had no nails on his fingers, and those on his toes were very rudimentary. His parents were both strong and healthy people, and the only cause which could be assigned for the malformation was that his mother had while carrying him a severe attack of yellow fever.

The PRESIDENT remarked that he wished Mr. Phillips had mentioned whether the patient had the normal quantity of hair; in many cases where the teeth were congenitally deficient there was a redundancy of hair about the body.

Mr. C. J. Fox also showed for Mr. Browne-Mason, of Exeter, a geminated molar and wisdom tooth.

Mr. COLEMAN then vacated the chair, which was taken by Mr. Woodhouse, and proceeded to open a discussion on the "Treatment of certain Forms of Dental Irregularity."

On certain Points in the Treatment of Dental irregularity : Extraction vice Expansion of the Dental Arch. By ALFRED COLEMAN, F.R.C.S.

GENTLEMEN,

A former president of this Society, and one whose opinions in practical matters I hold in great respect, my friend Mr. Barrett, has suggested to me, that in the absence of a paper containing original matter we might with profit discuss certain subjects in respect to which differences of opinion amongst us are known to exist. A sister Society has, as you are aware, devoted, occasionally, an evening to a discussion upon the nature of certain diseases—Cancer, Syphilis, &c.—and so successful and important have been the results of their discussions that I am emboldened to adopt, with the concurrence of the Council, the suggestion of Mr. Barrett, and attempt, in a small way, that which has been, on a much grander scale, achieved by the Pathological Society.

I have selected the above subject because my experience convinces me that a very great difference of opinion exists in regard to it. I am not, however, so sanguine as to believe that in discus-

sing it we shall arrive at conclusions which may determine our future practice, yet I venture to hope we may so far agree in generalities that our younger members at least may, as in the case of a sister profession, have in future "a case to go upon."

In regard to the question before us, I think it must now be acknowledged a settled point that the maxillæ, or at least their alveolar portions, in existing civilized communities are of a diminished size as compared with the uncivilized in present and past generations, whilst the contained teeth, if they have decreased in size, have not done so in the same proportion. The fact is evident, the explanation less so; although the views of Darwin and Wallace, that it has resulted from a smaller exercise of the jaws in civilized than in uncivilized communities, coupled with the tendency to perpetuate and increase the same by a sexual selection or breeding in, is the most satisfactory that has as yet been offered. Be this as it may, the consequence is that the dental surgeon of the present day is frequently called upon to bring into harmonious relation the teeth and maxillæ. For accomplishing this end two methods of procedure present themselves,—one, which is commonly termed expansion of the jaws; in reality but a small expansion of the alveolar arches, though often a considerable expansion

of the dental arches, by which means room is afforded for teeth which, owing to absence of space, have assumed prominent or otherwise irregular positions,—in plain words, making the jaws to harmonize with the teeth. The other method consists in simply lessening the number of teeth, or, in plain words, in making the teeth to harmonize with the jaws.

The first of these methods commends itself to our attention as being natural and conservative, and in its execution there is no great difficulty. Plates of vulcanite rubber, with compressed pegs of wood acting upon the lingual aspects of the bicuspidæ and molares, are adapted to the palatal surface of the mouth, and as the superior dental arch is thus laterally expanded, the inferior, from the interlocking of the teeth, follows, but more slowly. By such lateral expansion room is generally afforded to reduce prominent incisors or canines from irregular to even positions. In describing this process of expansion I have much pleasure in alluding to the ingenious appliance, first, I believe, suggested by Dr. Coffin, of this city, which consists of a vulcanite plate, such as I have described, but capping the teeth of necessity in the majority of cases, unless held in by clasps, wires, or ligatures, divided in the median line of the palate into two halves, which are held together by a piece of pianoforte wire bent

thus (Fig. 1), and which, acting as a spring, opens the plate, and thus gradually enlarges the dental

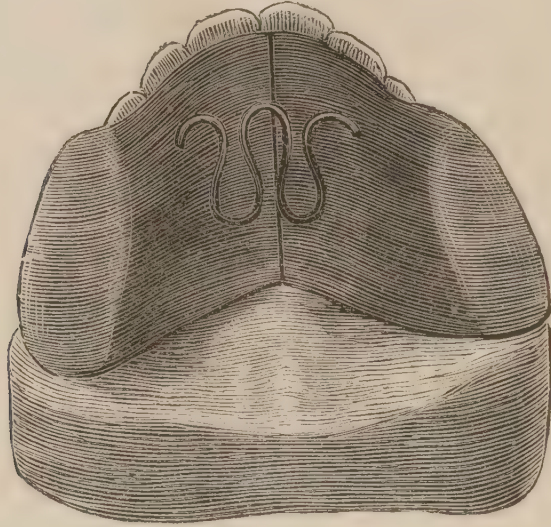


Fig. 1.

arch. The advantages of such an arrangement are obvious ; steadiness and uniformity of action, together with the avoidance of numerous visits so necessary in such cases, yet so much complained of by parents and guardians of youths at the ages such treatment is demanded. To Dr. Kingsley of New York, I am informed, must be accorded the credit for having suggested the connection of a small piece of zinc in contact with the steel wire, which prevents the rusting of the latter and its breaking after a few weeks.

Now without denying that this principle of extension is admirably suited for many cases—and I largely employ it myself in those where the bicuspidæ and the molares of one side are abnor-

inally approximated to the opposite side (Fig. 2), often so much so, that the teeth of the upper jaw

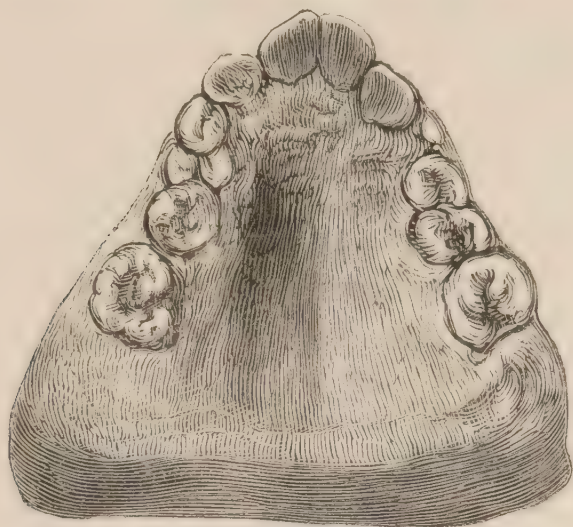


Fig. 2.

bite within those of the lower jaw ; yet in many, and indeed the majority, of cases arising from the conditions before stated, I adopt the second plan, viz., that of adapting the teeth to the maxillæ ; and from considerations best explained by adducing cases in practice.

In order that we might ascertain with some accuracy the merits of the two plans of treatment, it would, I am aware, be necessary to take a certain number of cases, and treat each first by the expansion method, and afterwards by a removal of certain teeth, followed by mechanical contraction of dental arches ; but even such a desirable end as could be thus obtained would never justify the means. I can, however, adduce a case in which this was done, and which, amongst

other subjects as well as this present question, I brought before the notice of the Society just thirteen years ago. The case in question was a female patient, aged thirteen years and a half, in whom, owing to the conditions dwelt upon, the eye-teeth were unduly prominent, whilst the upper lateral incisors had descended within the dental arch, and were bitten over by the cuspidate of the lower jaw (Fig. 3). At the time the case was treated, viz. some twenty years ago, much was



Fig. 3.

said and written in favour of expansion of the dental arch *vice* extraction, and acting upon arguments which then appeared to me as sound and rational, I carried out this object, not without difficulty, as our means and appliances at that time were not as efficient for the end as they are

now (Fig. 4). Considerable improvement followed; the dental arches became, the upper

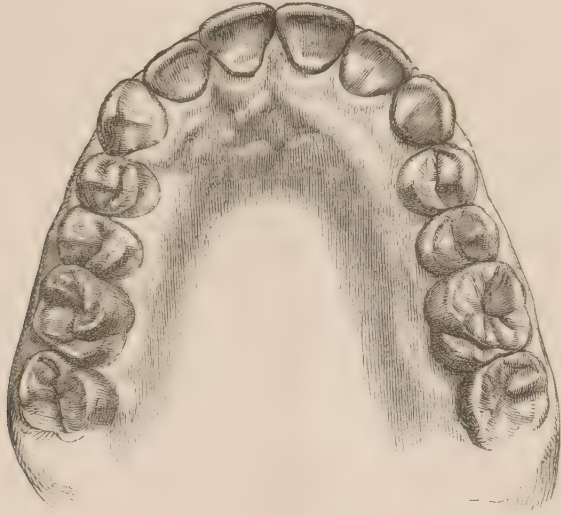


Fig. 4.

regular, the lower much more so; whilst, owing to the bite being rendered natural, the lengthening of the face and underhung expression had quite disappeared. But yet perfection was not attained, the mouth appeared out of proportion with the rest of the features, unduly prominent, and causing a somewhat plebeian expression; moreover, after three or four years, although a plate had been perseveringly worn at night, there was a slight tendency to return to the former condition, as the upper laterals, being somewhat short, were not kept in position by the bite. Under these circumstances I was not sorry to find the two first lower molars carious, and to remove them; and then by the sacrifice of

two bicuspides, the superior dental arch was reduced; indeed, without mechanical appliance the teeth soon fell into admirable position, and the mouth assumed a form in perfect harmony with the other features—a condition which exists, I can verify, up to the present time. My feeling that the above is a really instructive case must be my apology for bringing it before the Society a second time.

The next case I bring under your notice is that of a little girl, now aged 14 years, who came to me at the latter end of 1875, in regard to the prominence of her front teeth. From her position and circumstances, I recommended a second opinion, which the parents were the more willing to take as I proposed a sacrifice of two sound teeth in the upper jaw, the lower jaw being small, and its front teeth biting far within the upper arch. The opinion was not a confirmation of mine, expansion of the arch being recommended. I still adhered to my conclusions, explaining that, as the child had very small features I was convinced expansion would yield a feature out of proportion to the rest.

The photograph I hand round shows the case before treatment; the prominent central incisors resting on the lower lip, a soft elastic cushion, so fatal to the increase and perpetuation of this deformity.

This photograph, like most others, fails by exhibiting the features as larger than in reality ; and I regret that the parents who kindly lent me this have not had another done of the patient since, as I think you would feel convinced I had not erred in adhering to my decision in regard to the mode of treatment I pursued. This was removing the two upper first bicuspides and inserting a plate carrying an elastic band in front of the incisors and canines (Figs. 5 & 6). Mechanical treatment must, I think, be as a rule pursued

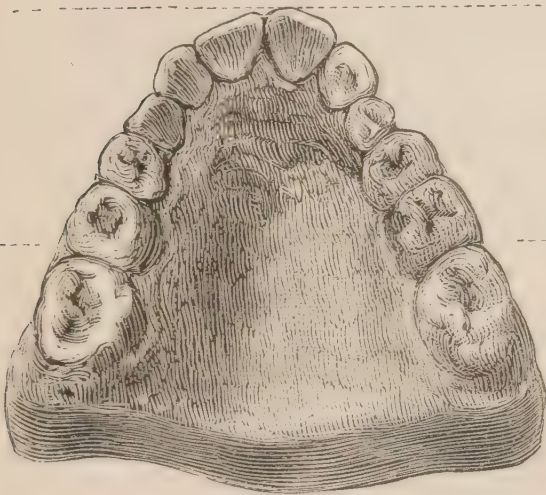


Fig. 5.*

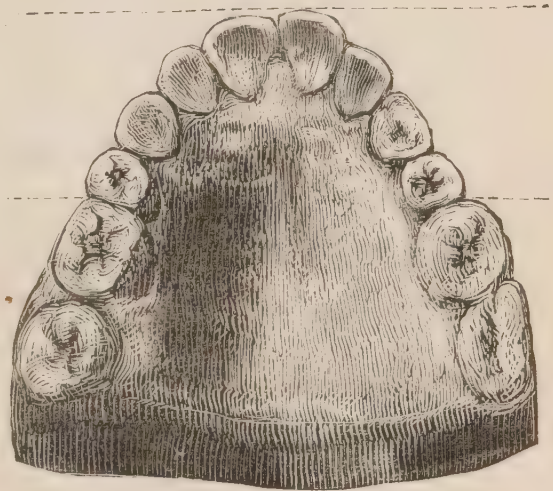


Fig. C.

when the incisors rest upon the lower lip ; otherwise, the mere pressure of the lips when they close over the teeth, will generally be sufficient to reduce the undue prominence. The value of being able to treat any case of dental irregularity with-

* The dotted lines are introduced to show the distance the incisors have been brought inwards by the treatment pursued.

out mechanical appliance is very great, for although by the strictest care and cleanliness much may be done to prevent injury to the teeth, I daily became more conscious of the evils attendant upon the long-continued use of regulation-plates, especially of such as have to cap the teeth.

Another case of a very similar character to the last, and which I then proposed to treat in the same manner, has at my suggestion been advised to obtain a second opinion, the result of which I am now waiting.

These, gentlemen, are my general views upon the subject, general because so many exceptional conditions present themselves in these cases, that I might, and for very good reasons, depart from them to-morrow. I can only regret that the members of the Society did not receive a notice of this discussion, as we might thereby have had the presence of some who could have shown strong grounds for antagonism to the position I have taken up. The fault however was entirely my own, my pocket containing up to yesterday the notice I believed I had posted to our worthy Secretary, of the object of our present meeting.

DISCUSSION.

The CHAIRMAN said he had been much interested by the paper which Mr. Coleman had just read, and he hoped that, considering the importance of the subject, a good discussion would follow. He thought, however, that only general principles could be settled beforehand : it was impossible to formulate any set rules which would meet all the numerous factors which had to be taken into consideration before commencing the treatment of one of these cases. There might sometimes be a difference of opinion as to the best mode of treating a given case, and each must be considered on its own merits. The age of the patient, for example, was a most important factor. At the proper age the removal of a tooth or two was all that was necessary ; the other teeth generally fell into their proper position of their own accord. But even this must not be taken for granted, for he had occasionally been obliged to use mechanical means in order to get the canine into line after the removal of the bicuspid.

Dr. FIELD said he was very anxious to hear the subject fully discussed, and would therefore do his best to set the ball rolling. He would commence by stating that he scarcely ever found it necessary to extract a tooth in order to correct irregularity. In judging of the success of one's own practice, it was necessary to remember that we don't always see our failures ; but allowing for this source of fallacy, he had met with a sufficient amount of undoubted success to encourage him to keep to the line of treatment he had indicated. As Mr. Woodhouse had remarked, a number of points had to be thought over in each case ; not only, for example, the general contour of the face, but also the action of the muscles must be considered. He had then under his care a young lady, aged 17, whose

facial muscles were constantly in a state of contraction. She was always puckering her mouth, &c., and he feared that this troublesome habit or infirmity would greatly interfere with the success of his efforts to expand the maxilla.

A good deal had been said about the tendency of cases treated by expansion to relapse when the plate was discontinued, but he had met with but little difficulty from this cause. The fact was that in many cases the patient did not wear the retaining plate long enough : it should be worn night and day for a considerable time. The case might be under treatment for six months, a year, or even two years ; but with care and patience success, save under very exceptional circumstances, was certain. Nor had he seen much injury done to the teeth by this treatment ; but it was most important that both the plate and the teeth should be kept scrupulously clean : he always impressed this strongly on the patient, and generally ordered them to use a wash of dilute carbolic acid. As to the means he used, he had nothing original to bring forward. For front teeth he used the inclined plane with hickory pegs, spring, or jack-screw. This last he never used except for a single tooth, because it had to be adjusted by the operator, and the patient could not remove it, for the purpose of cleaning, and replace it himself. For expanding the arch he used the plan spoken of by Mr. Coleman, that invented by Dr. Coffin. It was important to ascertain in each case the proper position for the spring, so as to get the pressure on the proper teeth. He had known it to cause separation of the median suture in very young children, proving that the spring had some power.

Mr. CATLIN thought it was quite impossible to lay down any general rule for the treatment of dental irregularities, since no two cases were ever exactly alike ; but he felt bound to state that when the irregularity could be remedied by extraction he preferred to avail himself of this method. In the first place treatment by expansion was only possible in the case of young patients. After the age of 19 or 20 it was useless to attempt it. Then the treatment was very tedious ; it must be persevered in

for months, or years, else the teeth would return more or less to their former positions. And lastly, he had undoubtedly seen great injury done to the teeth by the mechanical treatment. He had now under observation a patient, aged 34, in whom two upper molars had been loose ever since the wearing of a regulating plate, at the age of 10 or 12.

Mr. SEWILL was also of opinion that harm was often done by mechanical treatment. It was tedious and painful, and he had seen teeth loosened by it. The difficulty was to get a fulcrum, and to apply the force so as not to do injury to the teeth. Then it was impossible to gauge accurately the amount of force which was being applied. He thought that some of the ill effects were due to the occasional use of too great an amount of pressure. The surprising effect which might be produced by a comparatively small amount of force continuously applied was well exemplified by the deformities which resulted from burns, and also by the successful treatment of knock-knee in children by the simple plan of putting a pillow between the legs, and tying the feet together. He thought that in cases where the teeth were sound gradual expansion might sometimes be used with advantage; but in the case of delicate teeth he preferred to make plenty of room by extraction.

Mr. CANTON said that generally speaking he was in favour of extraction. In many cases the patients could not or would not give the time and attention which was absolutely necessary for successful treatment by expansion of the arch. Then the ultimate result of the treatment was always more or less doubtful, and there was the risk that the plate might do more harm than the expansion would do good.

Mr. ASHLEY BARRETT said that if the alveolar arch could really be expanded, that would be a strong argument in favour of expansion, but he was not aware of any means of accomplishing this with certainty. In most cases the crowns of the teeth were pushed out, while the position of the fangs was

but little altered. For this and other reasons he preferred extraction.

Mr. MOON said he was in the habit of using the expansion method in suitable cases. He had then a case under treatment in which he had applied Dr. Coffin's plates; but he used the jack-screw instead of the spring.

Mr. VANDERPANT thought that in children, at all events, irregularities might be remedied without the employment of any very serious or complicated measures. The habit of thumb-sucking was one very common cause of irregularity, and should always be inquired about.

The CHAIRMAN remarked that thumb-sucking was undoubtedly a common cause of displacement of the front teeth. He was in the habit of directing that the child should sit when reading, with its elbow on the table, and resting the upper lip on the closed hand; the deformity was easily cured by this means.

Mr. CHARLES TOMES said there was one point which had not yet been referred to during the discussion, but which appeared to him an additional argument against universal treatment by expansion. It was this: when an irregular set of teeth had been successfully expanded and brought into line, their tendency was to return to their former positions. If they did not return, what was it which prevented them? They were retained by mutual pressure, were, in fact, keyed out like the stones of an arch. But this close contact was not good. The teeth had a certain amount of motion in their sockets, and under ordinary circumstances, when a molar tooth had been extracted, facets would be found on each side, caused by friction against its neighbours. Under the circumstances just stated the force of this friction was much increased, and the wear proportionately greater. His opinion was that expansion was only suitable for cases where the amount of irregularity was slight, or when the mouth was exceptionably healthy.

The CHAIRMAN said he thought that the teeth were kept in position after expansion chiefly by their articulation with the opposite teeth, and that this was a great point to be attended to for the prevention of relapses. If the articulation was not very marked, it should be improved by the use of the Morrison engine.

Dr. FIELD said that so far as the discussion had yet gone he thought he was more called upon to make a reply than was the author of the paper, and he therefore asked the President's permission to supplement his previous observations. He did not object to the treatment by extraction when this was really necessary, but he did strongly object to the extraction of teeth, simply because it was easy. He looked upon it as wanton destruction of the dental organs. Much was said about the trouble and expense to the patient. As to the trouble, patients would readily submit to this in preference to the loss of sound teeth, if they were assured of the ultimate success of the treatment, and in the matter of expense he thought the dentist should rather forego a portion of his ordinary fees than do that which was not strictly the best for his patient. As to injury to the teeth, that could be obviated by proper care on the part of the patient, and there was no difficulty in making patients pay attention to these details if their importance was clearly and forcibly explained to them. He always took care not to have the teeth "keyed out," as Mr. Tomes had expressed it, but so placed as to allow floss silk to be easily passed down between them. The point to which the President had called attention was also important, viz., that *both* sets must be got into proper articulation. No hard and fast rule of treatment either by extraction or by expansion could be laid down, but he thought that in the great majority of cases success could be obtained without extraction, and he wished most emphatically to condemn the practice of extracting merely to save trouble. We profess to be striving to elevate the standard of the specialty of dentistry, and to place it on its legitimate level, side by side with the other specialties of medicine and sur-

gery ; but I fail to see that we take the steps most likely to aid in the accomplishment of this good work, when we, for such trivial excuses as "want of time," and the easier method, and for such sordid motives as "insufficient pecuniary compensation," sacrifice the very organs which we should strive by every possible means to conserve.

Mr. MERSON said that, having been house-surgeon at the hospital for nearly two years, he had had excellent opportunities of seeing the results of treatment by both methods. He had tried expansion, and with a certain amount of success, and had found the jack-screw of great value ; but in many cases it was necessary to consider not what was the best, but what was possible, and as the great majority of the hospital patients were quite unable to afford the time necessary for the proper carrying out of the treatment by expansion, he had generally been obliged to recommend extraction.

Mr. HUTCHINSON remarked that in connection with the plan of treatment by extraction, a very important question might be raised. Was it possible that, as practitioners now removed many teeth in jaws ill developed, in future generations would the loss or absence of teeth be transmitted hereditarily? In other words, does the extraction of teeth in parents lead to absence of similar teeth or contracted jaws in the offspring born afterwards? This point he would commend to the attention of those present, who would have many opportunities of taking accurate notes on the subject. For his own part, he did not think that extraction of teeth would have this effect any more than would the amputation of a leg or a finger in one or both parents lead to a deficiency or defect in the offspring. As to the question of expansion, he held that the most suitable cases were those of the so-called V-shaped upper maxilla, provided always the lower maxilla formed a normal arch, so that when the upper teeth were moved outwards they would properly inter-digitate with the lower ones. Where extraction would answer, he always preferred it.

Mr. GADDES said it was implied by Dr. Field, and alluded to by Mr. Hutchinson, that the extraction of teeth in childhood might in time lead to the suppression of those teeth in the offspring. If he rightly apprehended the principles of "origin of species" and of evolution, they gave no credence to the supposition so expressed. With reference to expansion of the dental arch, he thought they ought to determine whether it was not more desirable to expand the whole maxillary arch, rather than force the teeth outwards simply.

The CHAIRMAN said that it appeared to him most important not to remove teeth at too early an age. The] 12-year-old molars should be well up before the bicuspid~~s~~s were removed, else the space hoped for would be quite lost.

He then called upon Mr. Coleman to reply.

Mr. COLEMAN said that his paper had been written with the view of eliciting a good discussion, and he was pleased to find that it had been successful in this respect. At the same time he hoped he had not unduly depreciated the value of the expansion treatment. Had he known how little would be said in its favour, he might almost have appeared as advocating "expansion *vice* extraction." As a fact, he had found the expansion treatment very useful, and had obtained excellent results from it. Nor had he experienced much difficulty in carrying out the process, though it was certainly somewhat tedious, and it required scrupulous care on the part of the patient as well as the dentist to prevent injury to the teeth. He should have stated that the "Coffin's plates" should be articulated to the lower teeth as well as the upper, when the lower as well as the upper jaw was imperfectly developed, and thus the relative positions of both sets would be maintained. What he had desired to call attention to was the fact that mere mechanical success was not everything ; the harmony of the features must be studied. In patients with small jaws the other features were frequently small also, and the expansion of the jaws would altogether ruin the expression of the face. The age of the patient was certainly a most im-

portant point in relation to the treatment to be pursued. It was quite possible to extract too early. He had seen cases in which all bicuspidis had been removed, and yet the front teeth remained crowded, because the extraction had been premature. He had no doubt that the removal of teeth continued for several generations would result in the production of a smaller jaw in time. The surprising way in which cattle-breeders modified different features, almost at will, by breeding in and in, showed how strong was the tendency to transmit peculiarities by inheritance.

The thanks of the Society having been voted to Messrs. Coleman, Barrett, Field, &c., for their communications, the meeting adjourned.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE following applications for Membership have been received by the Council.

ADOLPHUS ALEXANDER, L.D.S., 9, Finsbury Place North,
E.C., Resident.

W. T. WOODS, 25, Chowringhee, Calcutta, Non-resident.

ORDINARY MONTHLY MEETING,

May 6th, 1878.

ALFRED COLEMAN, ESQ., PRESIDENT, IN THE CHAIR.

ON taking his seat the PRESIDENT said he had great pleasure in announcing that the highest distinction of the scientific world—the fellowship of the Royal Society—had recently been conferred on a member of their Society (Mr. C. S. Tomes). The prize had been thoroughly well earned ; but as the coveted distinction did not always happen to fall in the right direction, he heartily congratulated the gentleman referred to on having obtained it, and thanked him for the honour which had been conferred, through him, on the Odontological Society.

The Minutes of the previous Meeting were then read and confirmed.

The following candidates were nominated for the Membership of this Society :—

J. C. FORAN, Marshfield House, Eastbourne, Sussex, Non-resident.

GEORGE HOCKLEY, 45, Great Marlborough-street, W., Resident.

WILLIAM WEST, 9, Ackerman-road, Brixton, Resident.

JOSIAH W. WORSTER, 27, Newington-crescent, Kennington Park-road, Resident.

Mr. CHARLES TOMES exhibited a model showing misplaced or supernumerary canine ; also a lobulated fibroid tumour attached to the fang of a molar tooth, which had been sent to him by Mr. Morris, of Chester ; and an antique extracting instru-

ment, which had been presented to the Museum by Mr. E. B. West.

Mr. RANGER said he had met with a tumour similar to that just exhibited, but growing from a wisdom tooth. The tumour had been growing about eight months when the patient came to him ; the tooth was turned over on its side, and completely hidden by the growth. It had not given rise to any pain, but had been a source of annoyance on account of the occurrence of hæmorrhage from it at inconvenient times.

Mr. CHARLES TOMES showed a modification of Kirby's Pneumatic Mallet, which had been made for him by Mr. Frost, of Poland-street. He had always thought that the principle of Kirby's Mallet was good, and that its failure in practice had been due to the fact that sufficient attention had not been given to its manufacture. In his instrument the force of the blow was regulated by allowing a portion of the air which acted on the piston to escape from the cylinder through a series of small holes. Some or all of these could be opened or closed at will by means of a sliding tube fitted outside the cylinder : it was very important for the proper working of the instrument that this outer tube should be made to fit accurately.

Mr. HUTCHINSON said he had obtained one of Kirby's mallets from the dépôt, but had been obliged to discard it, owing to the fact that it was badly put together, and consequently very uncertain in its action. He was very pleased to testify that, so far as he had seen, Mr. Tomes's instrument worked with the greatest ease and readiness, and seemed to be thoroughly reliable.

The PRESIDENT then called upon Mr. G. H. Harding to read his paper on "The Process of Absorption in Bone and Tooth Structure."

*On the Process of Absorption in Bone and Tooth
Structure.*

By GEO. HILDITCH HARDING, L.D.S.

MR. PRESIDENT AND GENTLEMEN,

THE reason I have selected the subject of Absorption for my paper this evening is, that I am not aware that it has previously been brought before the notice of this Society in the form of a paper. I think that the process of absorption is a very interesting one, and especially so to us as Dental Surgeons, considering what an important part it plays in the various physiological and pathological changes which take place in the dental region, and that it opens up a field for vast future investigations.

The authors who have written upon it are not very numerous, neither do their views entirely coincide as to the manner in which the marvellous changes are effected. Billoth says: "The cause of the atrophy of bone along the walls of the Haversian canals, which takes place in most new formations in the bone, is difficult to explain. The appearances of the connective tissue and muscular substance, as well as of other soft structures when inflammatory new formations occur in them, are less strange; but that hard bony

substances should be thus absorbed is truly remarkable.”

Now, what is absorption in the hard tissues? I would define it as—

That process by which formed material is reclaimed or retaken up into the system by means of the absorbent cells, known by the name of “*osteo-clasts*.”

The process may be perfectly healthy and normal, or it may be entirely pathological, resulting from certain peculiar inflammatory conditions.

In illustration of its physiological action I would point out the important part it plays in the development of bone. The alteration in size and in shape of the various adult bones, as compared with those of the foetus, is accomplished through the influence of absorption and deposition. The lower jaw is a good example of this: in the foetus the angle is very obtuse, whereas in the adult it assumes almost a right angle, and in old age we again see it assuming the obtuse angle, this great change in shape being effected by the combination of those two forces.

Now, with regard to the increase in size of the adult bone compared with the foetal bone, this change is brought about in a similar manner; the external contour is increased by deposition taking place beneath the periosteum, and also beneath the articular cartilages, whilst at the same time

absorption is taking place in the interior of the bone; the internal layers are gradually being changed from the compact tissue into the cancellous, and so the medullary canal is increased in calibre, and as deposition is more active during the period of development than that of absorption, the walls of the medullary canals are increased in thickness.

Proceeding with this subject from its physiological aspect, I will examine briefly the great changes which take place in the dental alveoli.

During the formation of the teeth we find the formative process very active, and the bone is being built up around them until they are enclosed in bony cells or crypts; and if we examine them again at a later period, we find that the process of absorption has set in, by which the walls of these crypts are removed to allow of the eruption of the contained teeth.

The crypts which contain the incisors have their anterior walls removed, so as to expose the labial surfaces of the crowns of those teeth; whereas in the crypts of the molars that portion of the wall covering the points of the cusps is the first to be removed. After the teeth have erupted, the formative process again sets in, and the bone is built up around the erupting teeth, so that when they are fully erupted their fangs are encased in bony sockets. The deciduous set, together with their alveoli, are removed by the

advent of this absorbent process. In the incisors we find absorption as a rule taking place on the posterior surfaces of their fangs, and commencing near their apices; and in the molars absorption takes place in the upper jaw on the internal surfaces of the palatine and buccal fangs, which approximate the erupting bicuspid, and in the lower jaw the anterior surface of the posterior fang, and the posterior surface of the anterior fang, is the first to be removed. I will refer to this subject further on in my paper. In old age again, when these useful organs are too apt to throw off their mortal coils, or become the victims of the forceps or the elevator, their former habitations are removed by the absorbent process, so that in the edentulous jaw there eventually remains little but the dense compact tissue of the body of the bone. Having glanced, very superficially, at the prominent part this process plays in a few of the physiological changes which occur in the hard tissues, it will be well to consider its connection with certain pathological conditions and actions; but before doing so, I will describe the histological appearances presented, and some of the various theories advanced as to the method by which the lime salts are removed.

If an absorbed surface be examined by a moderately powerful magnifying-glass, it will present a rough, uneven, jagged, or, as one author aptly describes it, "a gnawed appearance," and

the surface will be covered with pits or excavations. If a section be cut through an absorbed surface at right angles to it, the edge of the section which has been acted upon will present certain peculiarities. It will appear to be made up of a series of arcs of circles, as though round pieces had been punched out of the edge; the spaces between these indentations being occupied by the sharp projections formed by the edges of the adjoining circular excavations.

I believe that Howship was the first to notice and investigate the nature of these excavations, and consequently they have received the now familiar name of *Howship's Lacunæ*. There is, in contact with a surface where absorption is taking place, a new formation which is richly supplied with cells; this is the absorbing organ. The cells are of the compound order.

In connection with the absorption of the temporary teeth, the new formation which is there present, and is identical with that found elsewhere in many respects, has been called by Tomes the "Absorbent Papilla," and it would be difficult to give a better description of it than the one given by that author; he says: "The surface is made up of peculiar multiform cells, each one being composed of several smaller cells, the number varying from two or three to as many as fourteen or fifteen. The form is variable, but egg-shaped or spherical figures are found to prevail, although

some few deviate from these forms and offer a very strong resemblance to those cells described by Kölliker as myeloid cells." If a section be made carefully from a fresh specimen, with the aid of some decalcifying agent, it will be seen these pits or excavations are occupied by cells. Sometimes it will be seen that one excavation will contain one cell, at others two or three.*

Völkmann describes certain changes, to which he has applied the name of *canaliculization*, and which takes place in the bony tissue previous to the advent of the absorbent process. He says that in examining sections at this period he has observed numerous canals ramifying through the tissue, which canals make numerous communications forming a very complete anastomosis. The outlines of these canals present numerous projections, which very much resemble the margins of bone lacunæ; and as these canals run in the same direction as the bone lacunæ, and occupy the position of former lacunæ which have been destroyed, he considers that they are due to the increased flow of blood in the part, consequent upon inflammatory conditions existing; and that the canaliculi of the bone cells by which the circulation in the bone is ordinarily maintained, become enlarged in order to meet the

* Rustizky found that if he applied vermilion to the living tissue where these cells were present, the cells took up the granules into their substance.

increased flow of blood which takes place. Völk-mann thought that these canals were occupied by capillary vessels. Rindfleisch has also observed this canaliculization, but does not support this latter view. He says:—

“I have never succeeded in injecting them from the blood-vessels, or in finding the characteristic elements of a capillary tube, such as a nucleated membrane, in their interior. Judging from the way they refract light, the contents of the canals must be identical with that of the bone lacunæ; hence I can only regard them as a further development of the nutrient apparatus provided by the system of anastomosing lacunæ.”

Bilroth says: “At present it is not known how the lime salts are dissolved in this process; I think the new formation in the bone develops lactic acid, which changes the carbonate and phosphate of lime into soluble lactate of lime, and which is taken up and removed by the vessels.”

Rindfleisch is of opinion that a solution of the intercellular substance takes place in the fluid. It has been a source of some controversy as to the manner in which *Howship's Lacunæ* are formed. Virchow and others were of opinion that each of these excavations corresponded to the nutrient territory of a bone-corpuscle. Bilroth says he is convinced that the bone-corpuscles have as little to do with this process as the fixed connective-tissue cells. I think that the fact of

our finding these *Howship's Lacunæ* in dental tissues which possess no bone-corpuscles (viz. Dentine and Enamel), would tend to disprove this statement altogether.

Passing on from its physiological characteristics we may consider this process from its pathological aspect.

Take first of all a case of *osteoplastic ostitis*, as an example of which I will consider a case of fracture, seeing that the inflammation set up is of that character. As a result of the injury, the tissues in the immediate neighbourhood become inflamed, a cellular exudation takes place in the medulla, on the surface of the bone and in the Haversian canals, and capillary loops form. The cells appear to collect upon the walls of the Haversian canals, and the flow of blood is greatly increased. The Haversian canals become enlarged by the gradual absorption of their walls; the cell-proliferation goes on as absorption makes room for it, and so the neoplasia thus formed in the two pieces of bone eventually meets and unites the fractured surfaces. If a section be made of a bone at this stage, *Howship's Lacunæ* will be plainly visible. Now when the required amount of neoplasia has been thrown out, ossification sets in.

This new formation may be either transformed into cartilage or it may ossify directly, and the new bone be deposited on the absorbed surfaces

of the Haversian canals, making the canals of the two fractured surfaces continuous; at the same time the neoplasia in the medulla and beneath the periosteum on the surface of the bone is undergoing ossification, forming the external and internal callus. If a section be made at this stage, the line of absorption in the Haversian canals can be discerned with the new bone deposited upon its surface. After a fractured bone has united, great changes take place in its shape and structure. There is great difference in the amount of callus which is formed in the various bones.

In the flat bones there is not much callus thrown out, and in those of the skull there is scarcely any formed at all; but the surfaces appear to be glued together, and the union which takes place in them is chiefly effected by the callus, which is formed in the Haversian canals at the expense of their walls, in the manner previously described. The amount of callus formed in some of the long bones is very considerable. The structure of newly-formed callus is of a very porous nature; this eventually becomes consolidated, and the superfluous callus is removed by absorption.

In long bones, where union has taken place whilst much displacement of the fragments existed, the masses of callus thrown out are so enormous that one can hardly imagine such de-

velopment taking place, were there not specimens to illustrate it.

Now, what is still more remarkable is, that in some of these cases, notwithstanding the gigantic masses of callus and great displacement of the fragments which exist, absorption and deposition so work together, hand-in-hand, sometimes for years, that eventually the bone becomes remodelled, the superfluous callus being removed where required, so that the original shape is nearly restored, and a new medullary canal tunnelled out in the place of the one obliterated by the fracture.

There are cases on record, or one would be unable to realize that such marvellous changes could be effected.

Bilroth states that where a fracture takes place in a spongy bone the bony cells become filled with bony substance, but that this is eventually removed by absorption.

In "caries," which is in reality a chronic inflammation of the connective tissue of the bone, accompanied by a wasting of the compact osseous tissue of the bone, we again find the granulating tissue being developed and absorption taking place.

The individual trabeculæ of bone become absorbed, and so cut off and removed. If a small flake of bone be removed from a carious spot, and be examined under the microscope, *Howship's*

Lacunæ will be seen on its edge; and should a section also be made from the bone in the immediate neighbourhood of a carious spot, and the lime salts removed by chromic acid, it will appear to be eaten away, and the carious edges will present the characteristic excavations met with on an absorbed surface, and fitting closely into these irregularities will be seen the new granulation-tissue.

In *necrosis* the portion of dead bone is separated from the living by the assistance of this process. Inflammatory action takes place in the adjacent living bone, granulation-tissue is thrown out, which removes the lime salts from the line of demarcation, and from the walls of the Haversian canals, which latter become consequently enlarged.

After the necrosed portion is thrown off, ossification sets in, and the Haversian canals form fresh communications, and so the circulation is maintained again, which was of necessity previously interrupted.

On microscopical examination it will be seen that the dead portion of bone which has come away has undergone absorption, as well as the living surface from which it has been detached.

There is only one more morbid process in bone to which I will allude, and that is the peculiar disease known as *Mollities ossium*. Here we find the bone not diminished in size, nor altered in

shape, but exceedingly brittle and porous in structure: it is easily cut or bent.

Rindfleisch says:—

“If we break off a minute trabecula from the cancellous texture of a bone affected with this disease, and, after soaking it in carmine, examine it under a magnifying power of 300 diameters, we find a highly characteristic set of appearances. The trabecula is seen to consist of two very different substances; it exhibits two very distinct zones,—an outer one lying next the medullary spaces and the Haversian canals, and an inner one, which forms the axis of the trabeculæ.

“The inner zone consists of perfectly normal bone-tissue. The corpuscles with their countless anastomosing prolongations, the highly refracting colourless basis substance, are unaltered.

“The outer layer, on the other hand, exhibits a finely striated basis substance deeply stained with carmine, in which only a few scattered streaks of shadow indicate the former position of the bone-corpuscles, and of their processes not a vestige remains.” The line of demarcation between these two zones is very decided, and exhibits the same semicircular excavations which are met with in other inflammatory processes which occur in bone-substance.

Green notices one or two rather interesting facts in connection with this disease. He states that the medullary tissue contains fat, that lactic

acid is found in the bone and also in the urine, and that lime salts are eliminated by the kidneys.

I should like to say more in connection with this subject in its relation to bone, but in order not to make my paper too lengthy I will pass on to the various dental tissues. It will be seen that here, as in bone, it may assume entirely a physiological action, or the process may be the result of inflammatory conditions. As an instance of the former, the shedding of the temporary teeth forms a good illustration.

Some hold the opinion that the deciduous tooth is removed by pressure exerted by the coming permanent tooth; but there is such abundant proof of the inaccuracy of this statement, that I do not think it can be accepted. One of the most convincing arguments against it is one advanced by Charles Tomes; it is this: that as the fang of the deciduous tooth becomes absorbed so the socket closes up behind it by the deposition of new bone; so that if the socket of a deciduous tooth, about to be shed, be examined, it will be found that a plate of bone exists between it and the coming permanent tooth, so that no pressure could, under those circumstances, be exerted.

Spence Bate, in a communication he once made to this Society, advanced the theory that in the removal of the deciduous set the enamel-organ of the permanent tooth performed the office of an absorbent organ; but this is again incorrect,

for at this period the enamel-organ of the permanent tooth has undergone calcification.

I think it has been pretty clearly recognized now, that for the removal of a deciduous tooth a proper absorbing organ is formed, called the *absorbent papilla*, the structure of which was described in the early part of this paper. This organ is accurately adapted to the absorbing surface, and on the removal of a temporary tooth we often find a portion of this organ torn away and adhering to the absorbed surface.

The appearances presented in the dental tissues are very similar to those seen in bone; but there are several differences which will require some consideration.

Of the three dental tissues, only one can be replaced after its removal by absorption, by a similar tissue,—viz. the cementum, or *crusta petrosa*. The enamel and dentine, when once removed by this process, can never be replaced by the same tissue, although they may be, and often are, replaced by cementum.

Microscopic examination clearly illustrates this result; a favourable specimen will sometimes show the *granular layer of Tomes* broken by the action of absorption, and the gap entirely filled by cementum; and the former line of absorption separating the two tissues with Howship's *Lacunæ*, plainly discernible, will be readily recognized. Under No. 1 microscope (Fig. 1), a

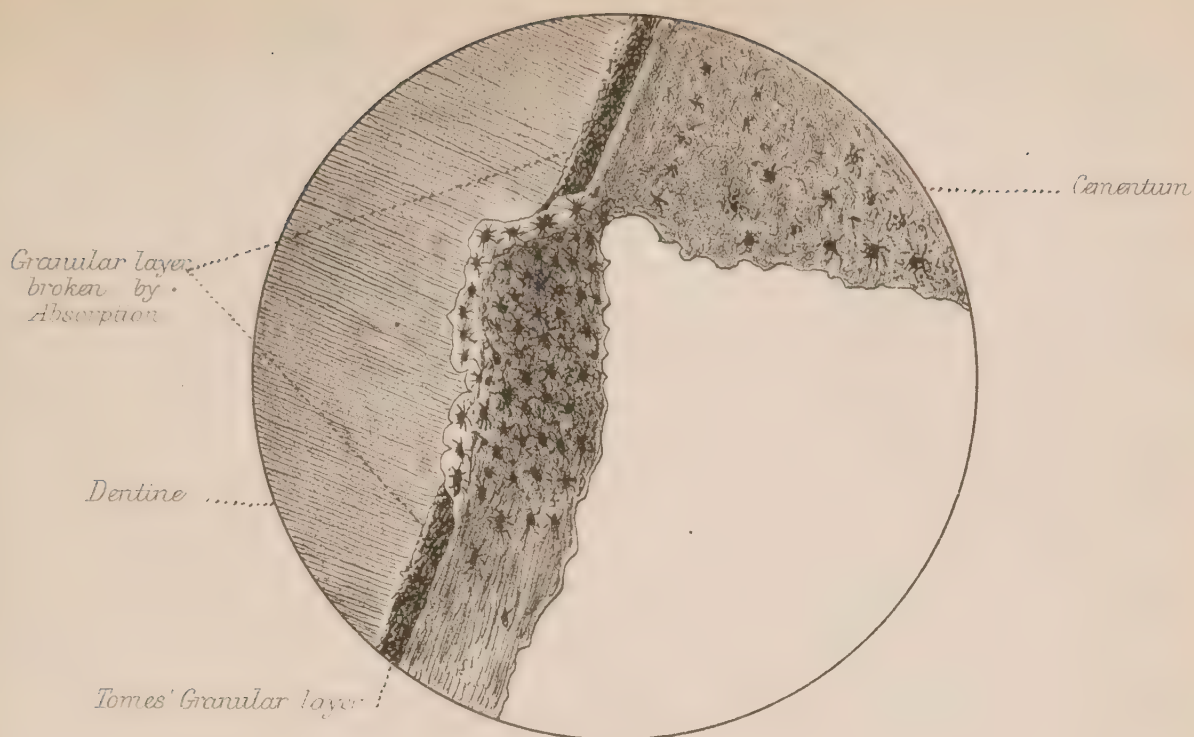


Fig. 2.

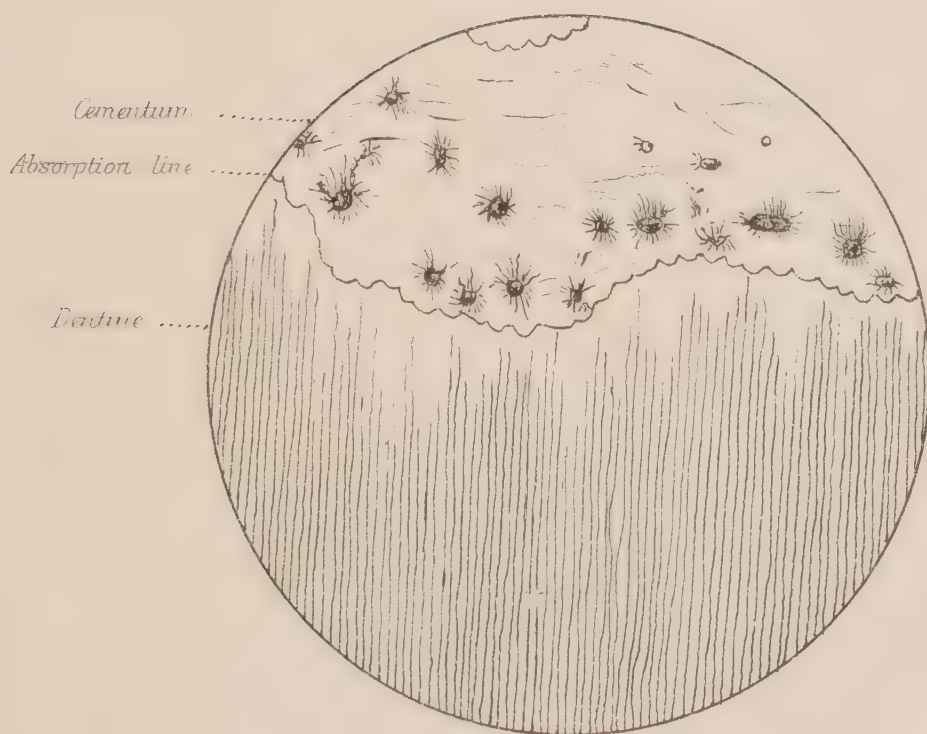


Fig. 1.

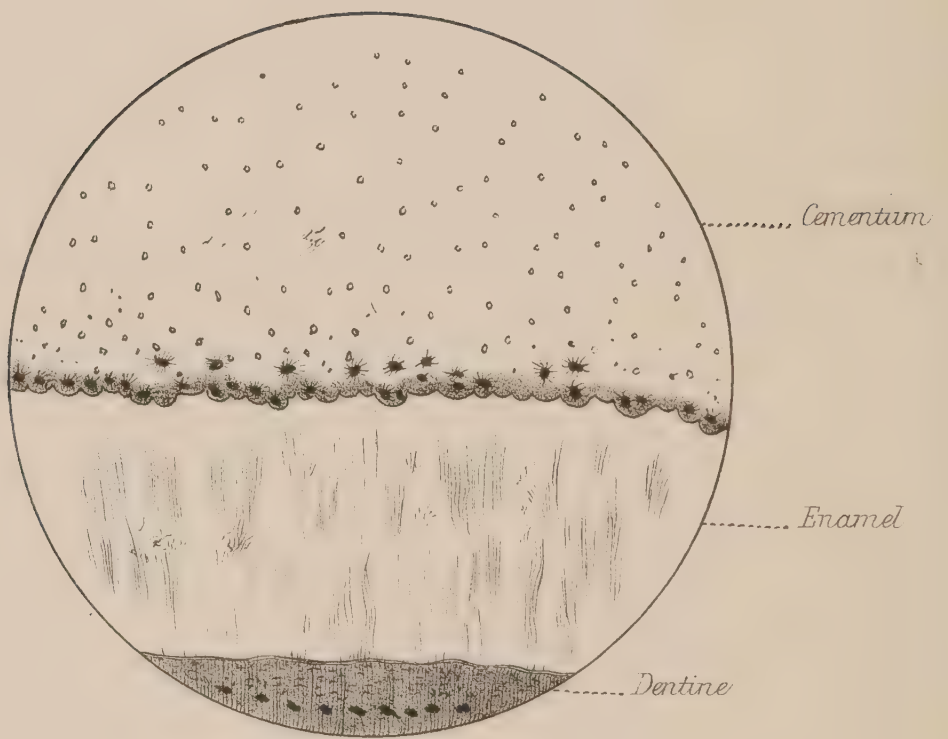


Fig. 3.

specimen for which I am indebted to Mr. Robert Brookhouse, of Manchester, is a longitudinal section of the fang of a human molar tooth, and well shows this appearance; also under No. 2 microscope (Fig. 2), for which I am indebted to Mr. W. G. Ranger, is a transverse section of the fang of the molar tooth of a rhinoceros, and in this specimen (which is very well marked indeed) the interruption of Tomes's granular layer can be traced. In some instances the enamel will be found to have been removed, and cementum-tissue deposited.

Under No. 3 microscope (Fig. 3) is a transverse section of a horse's tooth. On examination it will be seen that the edge of enamel which is in opposition with the cementum presents a number of excavations, each circular bay being occupied by several bone-lacunæ. From its remarkable resemblance to the ordinary absorption-line, I am inclined to think that it is due to that action. The process of absorption in temporary teeth takes place alternately with that of deposition. When bone becomes absorbed, new bone is often deposited on the absorbed surface, leaving only a light tracing to indicate where the former line of absorption once existed. The same is true of cementum, but not of the other two tissues, as has already been illustrated: in these, when once the process of deposition sets in, entirely a different tissue is deposited, forming a definite division.

The other characteristics which are presented microscopically in tooth-structure very much resemble those which have been described in bony tissue.

In absorption of temporary teeth all three tissues may be attacked, and in the following order:—

1st. The cementum.

2nd. The dentine.

3rd. The enamel.

We frequently find in practice that only a portion of the crown of a deciduous tooth remains, the greater part of the tooth having become absorbed.

Tomes is of opinion that in the later stages of absorption of the deciduous teeth the pulp takes upon itself an absorbing action, and so completes the work of the papilla.

Absorption in the permanent set must be looked upon as a morbid process. It generally arises as the result of chronic inflammatory conditions existing in the dental periosteum, or the result of irritation set up by impacted permanent teeth. With regard to that arising from chronic perioritis, it occurs usually, I think, in advanced life, and in those teeth the pulps of which have lost their vitality, the process of absorption being often succeeded by exostosis. Stumps which have been pivoted nearly always eventually undergo absorption, and some instances have occurred where the pin of the pivot-tooth has been exposed in this

manner. The fangs of permanent teeth which have undergone absorption *nearly always* present that transparent appearance when held up to the light to which Salter has applied the name of "*the horny fang*." In sections made from such teeth the structure is extremely indistinct, and the characteristics of absorption cannot be traced. The occurrence of cases where the fangs of a permanent tooth have been removed whilst the crowns have remained perfectly healthy is not nearly so frequent. The fang may be almost entirely removed, leaving little but the crown of the tooth remaining, and not giving rise to much pain or discomfort until the tooth becomes loose, and eventually falls out; but sometimes, long before it has reached this advanced stage, considerable pain and irritation is set up, which in many cases necessitates its extraction. On examination, it will be frequently found that absorption has been going on in a very irregular manner, leaving the apex of the fang extremely rough, and in many instances it will be found that quite a sharp spicula of dentine projects, which has received the common name of the "*needle point*." In absorption of permanent teeth in this manner, the dentine and cementum, I believe, are the only tissues attacked; at least, I have never met with a case in which the enamel has been implicated, the tooth being lost before that tissue was reached. In these cases I do not know of any treatment that will arrest the progress

of the disease. With regard to absorption of permanent teeth caused by impaction, I believe those most frequently affected in this manner are the twelve-year-old molars, by irritation set up by an impacted wisdom tooth pressing upon its posterior surface. Serious mischief is often set up in this manner, and not unfrequently the pulp-cavity is laid bare, giving rise to the most acute pain and various other complications, which are sometimes very extensive; and under such circumstances I would advocate the extraction of the twelve-year-old molar, but should affairs not have assumed so grave an aspect, the removal of the wisdom tooth would in all probability be the proper course to adopt.

As disturbance may be set up by the occurrence of this process in the second set, so the same may result in the deciduous set from the arrest of it. In the front incisors it is not an unfrequent occurrence for the apices of necrosed, non-absorbed fangs to be exposed by the absorption of the gum over them, and for them to protrude, causing very painful and sometimes extensive ulcers on the inner surface of the upper lip.

Alveolar abscess and gumboil are also very frequently met with in connection with necrosed temporary teeth, which often assume a severe character, and are accompanied with great swelling, &c. &c.

Ragged temporary teeth and stumps that have

not been removed by absorption are apt to cause severe ulcers on the tongue.

Lastly, the non-absorption of temporary teeth causes great irregularity in the permanent set. The teeth which I think most frequently assume the persistent phase are the temporary molars and canines; and one can readily see what crowding the retention of the temporary molar would cause, even though its successor did not make its appearance, from the fact of its being so much larger than the premolar. Sometimes the persistent temporary tooth is retained for many years, to the exclusion of its successor, and does good service during that period. I have met with instances where a certain temporary tooth has remained persistent in each member of a family. Now the question arises whether, if there is not much crowding, it is the better practice to allow these teeth to remain or to extract them? I think that in many instances, if they be extracted, the gap may remain for a considerable period unoccupied; and should the bicuspid happen to be buried deeply in the jaw, there is some probability of the crowns of the adjoining teeth approximating, and so sufficient space not being maintained for it.

How is it that the absorbing process is sometimes arrested?

Some have advanced the theory that dead tissue cannot undergo absorption; but I do not think that will hold good, seeing that, in Dieffen-

bach's operation in Pseudarthrosis, the ivory pegs are removed in this manner. In this operation the ends of the bone are perforated, and ivory pegs are driven in with a hammer: new bone forms around them. When these pegs are extracted, they will be found to be very rough at the points where they were in contact with the bone; if these pegs be not removed, they become entirely absorbed. On microscopical examination, this ivory presents the typical appearances of absorption. Another proof of the fact that dead tissue can be absorbed is, that the dead bone which is exfoliated in *necrosis* and *caries* also presents the same appearances.

Then, how is it that we find necrosed teeth do not become absorbed?

One would think that it is not so much due to the loss of vitality in the tooth, or to any chemical change taking place in its substance, as to some alteration in the character and functions of the absorbing organ. But this is a subject possessing great room for investigation, and I should prefer to leave its solution to abler hands, and should like to hear the opinions of other members respecting it. Before closing, I must express my indebtedness to the works of the following authors for much assistance in the production of this paper: John Tomes, Charles S. Tomes, Rindfleisch, Bilroth, Völkmann, Virchow, and Green.

In conclusion, Sir, I must apologise for the many failings and shortcomings of my paper; and I must confess that it was with some diffidence that I decided upon writing it, considering that I was a junior member of the profession, and knowing that there are so many older and abler hands who would have done more justice to this subject. If I shall have been successful in raising a discussion from which I can gather a few crumbs, I shall be amply rewarded.

DISCUSSION.

The PRESIDENT thanked Mr. Harding for the evident pains which he had taken to place before the Society an accurate account of the present state of our knowledge of a very important subject. He thought that probably the latter half of the paper would afford the best materials for discussion, since this dealt with matters which bore more directly on the practice of their profession. The mode of absorption of the temporary and of the permanent teeth, and the origin and structure of the special organs by which this was effected, were subjects of the greatest interest and importance. Our knowledge on these points was as yet far from perfect; there was plenty of room for further investigation. Mr. John Tomes was almost the only English author who had written on the subject. He hoped therefore that some of the members present might be able to increase our knowledge by the result of some hitherto unpublished observations, or that Mr. Harding's paper, by showing how widely authorities differed, and how much remained to be discovered, might stimulate some to work at and to elucidate some of these obscure points.

Mr. HUTCHINSON thought that the Society was greatly indebted to Mr. Harding for his interesting *résumé* of the present state of our knowledge of the process of absorption. There were at least two practical questions raised which were worthy of discussion. In the first place he wished to ask those of the Members present who had met with cases of persistent temporary teeth, whether they thought the best practice was to leave them alone, or to extract them, provided, of course, that they occupied the place of a permanent tooth which was either not erupted or was misplaced. Among his patients were three members of one family who each had a temporary canine instead of the permanent tooth, which had appeared in the palate: one brother was now twenty-five years of age. Then he would ask Mr.

Harding, whether in the course of his researches, he had come across any explanation of the remarkable fact that in the case of the temporary teeth absorption proceeded more rapidly if the pulp was living, whilst if the tooth had been filled, or the pulp destroyed with caustic, the process of absorption was apt to be very slow. But in the case of the permanent teeth, it was just the reverse; dead teeth were not unfrequently absorbed, whilst absorption of a living tooth was rare. A patient had recently consulted him on account of a loose wisdom tooth: he extracted it and found that the greater part of the fangs had been removed by absorption. This was, however, due to the fact that two years before the tooth had been extracted, filled and replaced, and, as a consequence of this, had lost its vitality. Now, why should absorption take place more readily in a temporary tooth with a living pulp, than in a permanent tooth when the pulp was dead?

Mr. CHARLES TOMES said it was true that when the absorption of a temporary tooth had advanced to a certain stage the last fragments were absorbed very slowly, but he did not think it had been proved that it was the destruction of the pulp which caused the arrest of the process. It might, with equal probability, be due to the fact that the fragments had become displaced, and had lost their connection with the periosteum, and they were, therefore, almost in the position of foreign bodies imbedded in the gum, but having no organic connection with it. The study of comparative anatomy threw some light on this point. In creatures like the frog, or crocodile, who were provided with a constant succession of teeth, the course of events was as follows:—At the base of the old tooth, on the inner side, a small tooth-sac appeared; this gradually moved forwards, and apparently cut its way through the wall of dentine into the pulp-chamber of the old tooth, the wall of this tooth undergoing absorption as the other advanced. The young tooth-sac then increased in size until it occupied nearly the whole of the pulp-cavity of the old tooth and caused absorption of its anterior wall; at last the point fell, or broke off, and the young tooth commenced an independent existence.

In this instance, the pulp of the old tooth was destroyed by the pressure of the young sac, yet the tooth was readily absorbed, and this was effected almost without the provision of any special organ; *i.e.*, there was no absorbent papilla; the active agent seemed to be a thin layer of osteoclasts, which was to be found between the old tooth and the advancing sac.

Mr. HUTCHINSON explained that he had not referred to delay in the removal of the last fragments of a deciduous tooth, but to cases where the pulp had been prematurely destroyed before absorption had commenced, or before it had advanced very far, and then asked Mr. Tomes whether the growing permanent tooth, in the human subject, was coated with an absorbent organ similar to that which he had described as being found in the frog?

Mr. TOMES answered that the advancing tooth did not carry the absorbent organ; this was quite distinct. It consisted of a thin layer of absorbent cells upon, and firmly adherent to the old tooth. It was not easy to demonstrate this layer, *in situ*, in the human subject; the frog's tooth was so much smaller, and, consequently, more manageable as a microscopic object; but as the effects produced were the same in the two cases, he thought it might be inferred, with some probability, that the means by which they were produced were also similar.

Mr. RANGER asked Mr. Tomes whether he did not think that, although the absorbent organ was distinct from the advancing tooth-sac, it was really the latter which set in motion the process of absorption?

Mr. TOMES said, that although the sac and the tooth which was being absorbed were not actually in contact, but were separated by a thin layer of connective tissue, still there was an evident relation between them, since the area of absorption accommodated itself accurately to the contour of the sac.

Mr. RANGER said he was of opinion that this also held good in the human subject. He had been led to this conclusion by such cases as the following:—A gentleman, aged 45, came to him complaining of pain in a left lower second temporary

molar, which still occupied the place of the second bicuspid. He extracted the tooth, and found the fangs almost perfect ; he thought this was due to the fact that the bicuspid, for some reason or other, had not come forward, and so no absorption had occurred.

The PRESIDENT remarked that he had once filled a temporary molar in a gentleman aged 67, and the tooth was then in such good condition that he had filled it with gold. He thought that what had been stated about the absorption of the deciduous teeth was very interesting. The old theory was, that these teeth had a definite period of existence, and that when this was accomplished they necessarily perished ; but more accurate observation had shown that they might be as "permanent" as their successors, and that it was the approach of the so-called permanent tooth which was somehow the principal factor which determined their removal.

Mr. ASHLEY BARRETT said he had not clearly understood Mr. Harding's statements respecting the absorption of dead teeth. In one part of his paper he had spoken of the absorption of dead fangs, and later on he had said that necrosed teeth were rarely absorbed, and spoke of the mischief which might be caused by their retention. He presumed that he meant to draw some such distinction as the following between a tooth which was merely dead and one which was necrosed. A living tooth was supplied with nourishment from its pulp within, and from the periosteum without ; a dead tooth was one in which the pulp had perished, and which had consequently lost its internal supply, but might still have some vascular connection with the periosteum ; whilst in the case of the necrosed tooth the supply from both sources had been cut off.

Mr. GADDES said that it was, perhaps, difficult to account for the immediate cause of an osteoblast taking on the function of an osteoclast. Mr. Harding had spoken of irritation or inflammation as causing this alteration of cell-function. He (Mr. Gaddes) thought that the explanation of such was more probably to be found in an alteration in the nutrition of

the cells. It was known that cells receiving an excess of nutriment proliferate rapidly; if no excess, or even a diminished amount of nutriment was received by the cells—say osteoblasts or connective-tissue corpuscles—they would carry out their function of perfect tissue-formation—bone, or connective tissue. In that manner is there a relation between excessive nutrition and cell-proliferation on the one hand, and between a diminished nutrition and tissue-formation on the other?

The PRESIDENT observed, with reference to Mr. Barrett's remarks, that the arrest of the process of absorption seemed to be determined not so much by the mere death of the tissue as by the occurrence of putrefactive change. A temporary tooth might be dead, but so long as it remained in a pure and sweet condition it was readily absorbed; a necrosed stump, on the other hand, was not only dead but was saturated with effete purulent fluid; and it was, perhaps, fortunate that this was not readily absorbed. It seemed as if a condition of high vitality in a tissue forbade absorption, that low vitality favoured it, and that putrefactive change prevented or arrested it. He did not put this forward as an answer to Mr. Barrett's question why absorption should take place in the one case and not in the other; it was only a statement of the difficulty in another form, and in no sense an explanation of it.

Mr. CARTWRIGHT remarked, that when temporary teeth persisted till late in life, it would generally be found that the missing permanent tooth was either lying horizontally, or else that it had remained deeply buried in the jaw; as soon as it came forward absorption began. He had met with the following case of absorption of a posterior lower permanent molar caused by the pressure of an impacted wisdom tooth. He removed the molar, and the wisdom tooth at last came forward. The patient, a gentleman 63 years of age, had previously consulted another dentist, who had attempted to save the molar by extracting the wisdom tooth, but had only succeeded in breaking off one of its cusps. With regard to Mr. Harding's question whether it was better to remove persistent temporary teeth or to leave them, he was decidedly of opinion that it was

better not to interfere with them unless there was evidence of the approaching eruption of the permanent tooth.

Mr. DENNANT remarked that the prolonged retention of temporary teeth was often hereditary in families. He had met with an instance where a temporary canine and molar had persisted in two generations, the same permanent teeth being absent in each case. Mr. Harding had mentioned the fact that stumps which have been pivoted frequently undergo absorption. He had recently met with the following instructive case:—An old lady, aged 60, came to him, who had lost the crown of the left upper canine. As nearly all her other teeth were sound, he thought he was justified in pivoting a crown to the root. The operation was successful at the time, but twelve months afterwards the patient returned, complaining that the tooth was loose: on examination, he found that the root had been perforated, and the greater part removed by absorption.

The PRESIDENT having called upon the author of the paper to reply,

Mr. HARDING said, that before replying to the gentlemen who had asked him questions, he would mention a case bearing upon the subject, which he had intended to have alluded to in his paper. It appeared in an article by Dr. Joseph Coats in the *Glasgow Medical Journal*. "A boy, aged 16, applied at the General Infirmary with a severe lacerated wound of the leg; gangrene speedily set in, and amputation was, consequently, performed through the middle of the femur. After the operation the flaps became gangrenous, causing a portion of the bone to protrude; the stump was therefore opened up, and two inches of the bone sawn off. After this the case went on satisfactorily. In the removed portion of bone a sequestrum was found, extending nearly its whole length. The sequestrum was found, on microscopical examination, to have undergone a considerable amount of absorption; the surface was rough and eroded where it had been covered by soft tissue, whilst that portion which had been exposed was quite smooth, no absorption having taken place: a decided ridge

separated the two surfaces." This case was interesting from the fact that it showed that dead bone might, under certain circumstances, undergo absorption. For had it taken place previous to the death of the bone, the whole of the sequestrum would have been affected. In reply to Mr. Hutchinson, he thought that in most cases where the fangs of dead deciduous teeth had failed to be absorbed, both the cementum and dentine had become necrosed. With regard to the question asked by Mr. Ashley Barrett, when he spoke of dead fangs in the early part of his paper, he referred to permanent teeth with dead pulps, whilst later on, when speaking of necrosed fangs, he referred to the deciduous set. In answer to Mr. Gaddes, he was aware that many authors were of opinion that the osteoblasts were capable of performing the function of osteoclast cells. At the same time he would mention that the latter were much larger than the ordinary bone-forming cells, and had therefore received the name of "giant cells"; their outlines also were very irregular, and they possessed many divergent processes.

After the usual vote of thanks, the PRESIDENT announced that on the next occasion a discussion on the Nature and Treatment of Riggs' Disease would be opened.

The meeting then terminated.

ORDINARY MONTHLY MEETING,

June 3rd, 1878.

ALFRED COLEMAN, Esq., PRESIDENT, IN THE CHAIR.

The Minutes of the previous Meeting were read and confirmed.

The following gentlemen signed the Obligation Book and were formally admitted to Membership by the President.

JOHN LAWS, Esq.

THOMAS F. PEDLEY, Esq., and

F. H. BENHAM, Esq.

Mr. W. T. WOODS, of Calcutta, was proposed by the Council for election.

The following gentlemen were then balloted for and unanimously elected Members of the Society, viz. :—

STORER BENNETT, 17, George-street, Hanover-square,
L.R.C.P. London, M.R.C.S. England, L.D.S., R.C.S.,
Resident.

G. C. DABOLL, Paris, Buffalo, New York, D.D.S., Non-
resident.

T. G. T. GARLAND, 2, Stafford-villas, Heavitree, Exeter
Non-resident.

JAMES MERSON, 35, Harley-street, W., L.D.S., R.C.S.

The PRESIDENT having announced the result of the ballot,

Mr. UNDERWOOD rose and said he found that he had given his vote under a misapprehension. He had asked the Secretary when the box was brought round what candidate was being

balloted for, and he understood him to say "Mr. Storer Bennett"; he now heard that *four* gentlemen had been elected. He had no reason to suppose that any one of the four was not worthy to be a member of the Society, but he thought the present haphazard plan of election dangerous, and greatly preferred the good old rule of balloting for each candidate separately.

The PRESIDENT said the present plan had been introduced because it had been found that passing round the ballot-box for each of a number of candidates separately occupied a good deal of time and distracted the attention of members from other business. If any one of the candidates should be considered objectionable, all should be black-balled at the first ballot; the box would then be sent round for each candidate separately, and the objectionable individual would thus be eliminated. He would send the box round again if Mr. Underwood had any doubt respecting any of the candidates, but if it was only the manner of voting to which he objected, he (the President) would suggest that Mr. Underwood should bring the matter before the Council at their next meeting, and he felt sure that it would receive their most careful consideration.

Mr. UNDERWOOD said he did not think that the passing of the ballot-box need interrupt the Casual Communications; but even if it did cause a certain amount of inconvenience, he should look upon this as of small account in comparison with the welfare of the Society, and he believed it to be a point of vital importance that the elections should not be hurried over in a slovenly manner. He would take the first opportunity of bringing his views before the Council.

In the absence of the Curator, the President brought forward two contributions to the Museum. The first was a cast of the jaw of an aged negress, sent by Mr. Rutterford. The jaw, which was edentulous, was remarkable for its great size. The President remarked that it was a pity the cast had not been taken whilst the teeth were *in situ*; for if their size was pro-

portionate to that of the jaw, the *tout ensemble* must have been very striking.

Mr. O'MEARA (of Simla) had presented the head of a young alligator. The donor stated the species to which this specimen belonged was one of the most innocent of the tribe, for it lived upon fish and did not attack men. When full-grown they measured about 30 ft. in length.

The PRESIDENT then handed round a regulating-plate contrived by Mr. J. S. Turner, in which the action of the ordinary hickory peg was aided by the application of a spring. A piece of ordinary watch-spring was riveted on to the plate; at the free end of the spring was a gold eyelet, and in this a wooden peg was fixed, its length being increased from time to time as the tooth moved.

Mr. PEDLEY showed the form of regulating-plate which he had been in the habit of using for some years. Instead of wooden pegs or springs, he turned up a flap of vulcanite from the plate just behind the tooth, and attached to this by means of silk a small block of india-rubber, so cut as to exert moderate pressure on the tooth. As the tooth moved, the size of the pad could be increased, or, by slightly warming the plate, the flap could be brought further forward.

Mr. WOODHOUSE said he had long been in the habit of using a similar plan, differing only in the manner of securing the block: he drilled a hole through the plate and passed a loop of rubber through.

Mr. OAKLEY COLES exhibited a specimen of Ozokerine which had been sent by Messrs. Field. It was a product of petroleum, and was in all its properties very similar to the substance called Vaseline, which had lately been coming into use, but had the advantage of being much lower in price. It would be found useful as a substitute for soap or oil, for coating Stent's composition or for preventing adhesion between wet plaster casts.

Mr. OAKLEY COLES also showed a modification of the clinical

thermometer which he was in the habit of using occasionally for taking the temperature over inflamed teeth.

Mr. RANGER asked whether Mr. Coles had found the thermometer of any practical utility: did he find any sensible difference between the temperature of an inflamed tooth and its neighbours?

Mr. COLES said that a decided elevation of temperature could be demonstrated by the thermometer over the focus of the inflammation; but as this was generally indicated by other evident signs, the use of the instrument for this purpose was, in most cases, rather a matter of scientific interest than of practical use.

Mr. COLES said he wished to call the attention of members to a communication from Dr. Buck, which appeared in a recent number of the *St. Petersburg Medicinisch Wochenschrift*, respecting the action of salicylic acid on the teeth. This substance is a powerful antiseptic, and is often prescribed on this account. Dr. Buck had been in the habit of brushing his teeth with a lotion containing about three parts of the acid to 100 of water. After a few weeks he noticed that the surface of the teeth was becoming soft and granular, and on grinding them together there was a feeling as if some grit or sand was interposed. Further investigation convinced him that this was no illusion, that the acid did really destroy the surface of the teeth by entering into combination with some of their constituents. Dr. Buck thinks that a salicylate of lime is formed, and he therefore warns the profession and the public against the use of this substance as a lotion for the mouth or teeth.

In the absence of Mr. Chas. Tomes, the Secretary then read the following communication respecting Slayton's Amalgam, which had been sent to the committee by Mr. William Foster, the Lecturer on Chemistry at the Middlesex Hospital Medical School.

“GENTLEMEN,

“*Slayton's Amalgam (Felt Foil).*

“I have recently examined a specimen of this amalgam at the request of some members of this hospital. I understand that the substance has not been before the members of the Dental Profession for a great length of time; a knowledge of its composition may therefore be of some interest. I am strengthened in my opinion on this point in consequence of some conversation I have had with several of my pupils, from whom I learn that the general impression is that it does not contain mercury.

“It consists of three metals,—tin, mercury, and silver, and the following are the proportions of these components in 100 parts :—

| | |
|-----------------------|------|
| Tin..... | 84·9 |
| Mercury | 10·3 |
| Silver..... | 4·0 |
| Error from loss, &c., | ·8 |

“The details of the analysis were of the ordinary kind, and are devoid of interest.

“I am, Gentlemen, yours, &c.,

“WILLIAM FOSTER, B.A. (Cantab.), F.C.S.,

“*Lecturer on Chemistry,*

“*Middlesex Hospital Medical College.*”

Mr. HENRY SEWILL then said :—Mr. President, during a discussion on gout at a recent meeting of the Harveian Society, the latent form of the disease was referred to, and some remarks were made respecting the difficulties of the diagnosis in such cases. Amongst other aids, the importance of an examination of the teeth was insisted on by some of the speakers. I must confess that the facts then mentioned were new to me; and as I thought that possibly some other members of this Society might be equally ignorant, I have brought the subject before you this evening. I had never seen any mention of the effects of gout on the teeth in any book on Dental Surgery, and on inquiring of Dr. Milner Fothergill, he could only refer me to

the lectures of Professor Laycock, of Edinburgh. Dr. Laycock says the teeth of gouty subjects, so long as the disease maintains the sthenic form, "are massive, well enamelled and regular, undecayed even in advanced life. I have observed that the teeth often come out undecayed, and that such teeth are apt to be worn down, though free from caries, probably from the action of uric acid in the saliva; for the saliva of such persons is usually somewhat acid, though I am not in a position to say what acid it is. The teeth of the gouty, especially of the sthenic form of gout, are very characteristic and their peculiarities are commonly sufficiently well marked to be diagnostically useful." Dr. Stewart, of Southwick-street, Hyde Park, who also spoke on this subject at the meeting of the Harveian Society, has taken a number of casts of the teeth of gouty patients, which I will hand round: they fully confirm the accuracy of Dr. Laycock's description. It is especially important for us to recognize the connection of extreme erosion of the teeth with the gouty diathesis, since this will give us a valuable hint as to treatment.

Mr. WOODHOUSE said he had often noticed the peculiar teeth of gouty patients—massive, generally yellowish in colour and eroded, but not subject to decay. His attention had been specially drawn to the subject some years back by the following case:—A gentleman, a gouty subject, having lost an incisor, Mr. Woodhouse supplied another, carefully imitating in size and shape the corresponding tooth which remained. But when the patient returned after a year or two, the new tooth was found to be decidedly larger than the old one, and after another interval the difference was still more marked. Further examination showed that the other teeth were similarly acted on: they appeared to be slowly melting away.

Mr. OAKLEY COLES suggested that Mr. Sewill would find some further information on the subject in Dr. B. W. Richardson's work on "The Medical History and Treatment of Diseases of the Teeth," published in 1860 by Baillière.

The PRESIDENT said he could readily confirm the accuracy of

the description they had just heard. Although in most books erosion was treated of under the same head as caries, they were probably quite separate diseases, due to different causes and requiring different treatment.

DISCUSSION ON THE NATURE AND TREATMENT OF THE SO-CALLED RIGG'S DISEASE.

The PRESIDENT announced that Mr. Chas. Tomes, who was to have opened the discussion, had unfortunately been prevented from attending the meeting that evening ; but he had sent a short statement of his views, which would now be read by the Secretary.

Mr. Tomes's letter was as follows :—

“MY DEAR COLES,

“As I am unable to be present at the discussion, in which I am much interested, and should be very glad to have many points in the pathology of the disease elucidated, I would suggest that the experience of our members should be gathered in reference to the following points.

“(1.) The frequency of the occurrence of the disease in persons of middle life who manifest no other sign of senile degeneration ; its occasionally sudden advent ; its sometimes acute and comparatively painful course ; the abundance of discharge in acute cases ; its occasional curability. To me personally these characters would be sufficient to establish its distinctness.

“(2.) The earliest signs of trouble and the results of treatment would seem to point to the immediate margin of the alveoli (and doubtless their periosteum) as the primary seat of trouble ; and the diseased action not to differ much from caries of bone ; but on this matter evidence is very much needed.

“(3.) I have certainly seen cases in which I could discover no tartar ; these were in an early stage, but still the disease was

thoroughly well-marked. On the other hand, the occurrence of a small quantity of tartar within the gum is exceedingly common, whilst the disease is comparatively rare. Again, when tartar is present it is often situated some distance above the site of active destruction of the alveoli which is thus going on beyond the range of the tartar. And further than this, tartar is abundantly found on the roots of teeth which have been slowly bared by ordinary senile loosening, and which have presented none of the characteristics of the more rapid disease. So that the conditions under which tartar has, and has not, been met with, so far as my own observations go, would preclude the idea of its having anything more than an accidental connection with the disease. But on this point the experience of a single individual is too small for the drawing of a certain conclusion.

“Regretting my unavoidable absence from the meeting,

“I am yours very truly,

“CHAS. S. TOMES.”

The Secretary then read the following letter from Dr. Arkövy :—

“BUDAPEST, *May 28th*, 1878.

“MY DEAR SIR,

“The announcement that Mr. Chas. S. Tomes will open a discussion at the next meeting of the Odontological Society on the so-called ‘Rigg’s Disease,’ gives me great pleasure, inasmuch as I hope to profit by the observations of our excellent fellow-practitioner. All who are engaged in paying attention to oral surgery, besides dentistry *strictissimo sensu*, know how great an importance this disease has, which will be, as I hope, enlightened at your meeting.

“The original paper, where Rigg described the disease is not in my possession, but by comparison I see that it is very likely the same that we find described by J. Salter, under the title ‘False Scurvy’ (‘Dental Path. and Surgery,’ p. 184), and by John and Chas. S. Tomes as ‘Absorption of the Alveoli’ (‘Syst. Dental Surgery,’ pp. 511–514); and while the latter

remarks that the disease is 'very intimately connected with chronic inflammation of the gums,' both agree in the opinion that 'the causes and pathology of the disease are very obscure' (Tomes), and 'are neither constant nor always intelligible' (Salter). As the best proof of the want of clear intelligence and well-based apprehension on the matter may be regarded the manifold nomenclature used for it; as—besides the above-named—*Pyorrhœa alveolaris*, which is only a symptom; 'Catarrhal Inflammation of the Gum and Root-membrane,' &c.

"These circumstances and the urgent daily requirements of practice gave me the motive to inquire into the ground of the subject with all means in my power, and I may say the trial has not been without result; as to success others will decide.

"During the past year I have been engaged in carefully collecting data concerning specially the etiology and pathological anatomy of the disease, which still wants its own proper scientific name. A good many cases, directed by colleagues, have come under my observation, but I do not yet find them sufficient to consider the inquiry as duly concluded. There are the microscopical details which are still unfinished, and some minor points belonging to the etiology: notwithstanding I hope you will *for now* kindly remit these details and give me the permission to bring to your kind notice the promise that, as soon as I shall have completed the inquiry, I intend to submit my observations for discussion to the Society: I think three or four months will suffice for the purpose.

"At this occasion, please allow me to give utterance to my hearty thanks for the appreciation with which you kindly remembered me in your Presidential Address in February; I assure you it only instigated me to answer by a new trial. This month I began, at the Institution for Experimental Pathology and Pharmacology of the University, some vivisectional experiments on dogs, to get clear about the still open question whether secondary dentine can be produced after removing a certain part of the odontoblast layer of the living pulp, and if so, how and by what means. I am obliged, as you know, to wait three or four months at least for the result.

If I get such, I shall offer the paper, with drawings, in its full extent, to the Society.

“Do not be angry at the trouble I give you, and please receive the assurance of my best thanks in advance.

“Yours faithfully,

“DR. JOS. ARKÖVY.”

Mr. OAKLEY COLES then opened the discussion with the following address :—

On the so-called Rigg's Disease.

By OAKLEY COLES.

MR. PRESIDENT AND GENTLEMEN,

THE naming of any disease after the first person who may have described it is generally a source of inconvenience and misunderstanding. In the case of fractures of certain bones in a particular manner, it may not be of so much moment,—as, for instance, in Pott's fracture and Colles' fracture; but when in place of a distinct and well-marked injury to a bone, we have a pathological condition with which we are only imperfectly acquainted, giving rise to certain local manifestations, of which it is not easy to say whether they are causes or effects of the diseased condition, the inconvenience of a "personal" nomenclature becomes at once apparent. Names, if they are to be really useful, should be based upon some easily recognized pathological change, or some well-marked and more or less persistent symptom; as, for instance, such names as Hypertrophy of the Gums, Radicular Odontome. I make these remarks with no desire to lessen or detract from the honour due to Dr. Rigg, of the

United States, for being the first to fully enter into a description of a lesion that had previously been but vaguely and uncertainly alluded to.

That the condition known as "Rigg's Disease" is a distinctly marked pathological state requiring a special name there can be no doubt.

What that name shall be, may, I think, be wisely left until we are better acquainted with the processes by which a clearly recognizable result is brought about. Meantime it may perhaps be useful to bring together our experiences, with a view to the elucidation of the question.

My attention was first drawn to the matter under discussion nearly thirteen years ago, when I was called upon to remove the tartar from the teeth of a well-known and very hard-working contractor. The lower teeth were all perfect, with only a small amount of tartar on the lingual side of the lower incisors; the upper teeth, however, were covered with a greater amount of tartar, especially on the labial surface of the molars; there was a slight amount of tartar on the bicuspid and incisors, still only a little in excess of that which I found in the lower jaw; the margins of the gums were slightly thickened and everted, but the rest of the mucous membrane was healthy and not inflamed, the gums were free of cast-off epithelium, and the papillæ only slightly enlarged.

The teeth were of a bony yellow colour, and soft in texture and semi-translucent in appearance.

The palatine fangs of the upper molars were exposed nearly to their apices, and a roughened surface, doubtless due to minute nodules of tartar, could be felt on the labial fangs; over the left upper central and lateral incisor, a curious recession of the gum had taken place, leaving the necks of those teeth partially exposed.

The area of the recession was distinctly circumscribed and limited to the region of the teeth I have named.

During the last twelve years I have, of course, seen many more cases of a somewhat similar character, and so far as my observations have gone, the disease occurs most frequently amongst men who are subjected to great mental strain. I have found it especially prevalent amongst civil-engineers, physicians, and barristers.

It also occurs with those who have recently returned from India, and especially where the patients have suffered from jungle fever.

Amongst women it is most prevalent after exhausting illness, after frequently-recurring pregnancies, and also associated with an excessive menstrual flow.

My observations have thus led me to the conclusion that the condition is to be classed with "the diseases of modern life," that is, that it is

dependent on diverted or impaired nutrition, and is to be regarded as a local manifestation of a general constitutional condition. It may in many respects be looked upon as localized premature senility.

And this view will, I think, explain the cause of some of the symptoms.

In the so-called "Rigg's Disease" we have absorption of the dental periosteum and the deposition of granulated particles of tartar attached to the denuded fangs of the teeth; these symptoms may or may not be associated with a recession of the gums and alveolus, whilst the expulsion of the tooth from its bony socket will depend upon its position relatively to the other teeth. Incisors will be generally erupted, whilst molars and bicuspidis that have not lost their antagonists will, as a rule, remain on the normal horizontal plane.

It will be seen that we have in the cases under consideration symptoms strongly resembling those that arise during pregnancy and lactation, and which, as I pointed out in a paper that I had the honour of reading before the Society, are doubtless due to impaired local nutrition.

The point will, I think, scarcely be disputed, that an excessive strain or use of any organ or viscus will produce some local manifestation of impaired nutrition more or less remote from

the abnormally nourished region. That the evidences of impaired nutrition should be most clearly manifested in those organs with a low vascular supply might, *à priori*, be reasonably expected, and is fully borne out by our knowledge of facts. If we accept this view, we are left the less in doubt as to the cause of the so-called "Rigg's Disease," and the relation between the absorption of the periosteum of the tooth and the deposition of the tartar on the fangs.

Turning now to the more local points of interest, we find the tartar, instead of being deposited in layers or smooth masses, is granulated and nodulated in appearance, and resembles the "mulberry-stone" variety of urinary calculus. I am inclined to attribute this condition of the tartar not to any special form of chemical precipitation of the salts, but simply to the "accident of opportunity." The tartar is deposited at the points of least resistance, that is, on that part of the tooth corresponding to the depressions on the cancellated surface of the softened alveolus, and it is on account of this intimate relation between the two that it has been found so beneficial (as Dr. Field pointed out in his interesting communication on the subject) to scrape and cut away portions of the alveolus in addition to thoroughly cleaning the fangs of the teeth.

The question will probably arise as to why this condition of the deposition of tartar should occur in middle life and not in old age, when the process of senile decay is more complete.

The statement of the case contains an explanation within itself, I think. It is precisely because the conditions of senile decay are complete in the mouths of those aged people who have retained some of their teeth, that we do not find any deposition of tartar (as a rule) upon the fangs.

In old age the changes in the texture of the tooth, the atrophy of the periosteum of the fang, and the recession of the gum and alveolar processes take place gradually, but co-incidentally, and the margin of the gum remains to the last in close contact with the fang of the tooth; so much so, that the pain of extracting one of the loose teeth of old patients is often very great.

In the cases we are now speaking of we have a more or less sudden cutting off of the vascular supply, and subsequently to the atrophy of the periosteum, absorption, leaving a *cul de sac* in which the tartar becomes deposited. Free access to the alveolar cavity having been once established, it is easy to understand how the process of loosening is hastened by the irritation of such foreign bodies as minute granules of tartar deposited on the fangs of the tooth.

The alveolus and gums being extremely vascular, do not recede at the same time that the periosteum becomes absorbed; and hence we have the tooth surrounded with bone and mucous structures, but loose in its socket.

I have thus endeavoured to show that the condition hitherto known as "Rigg's Disease" is due to impaired nutrition and atrophy of the periosteum of the fang of the tooth, whilst the appearance of the tartar deposited on the fangs is owing to the nature of the surfaces that form the boundaries of the *cul de sac*.

If the view of the case I have brought forward meet with the support of the profession, we shall probably have taken one step towards finding an accurate name whereby we may scientifically speak of this disease, for directing attention to which we are indebted to Dr. Rigg.

DISCUSSION.

The PRESIDENT remarked that the disease which they had met to discuss was certainly one of the most distressing and intractable with which they had to deal, and though many might consider its present name inconvenient, all would feel grateful to Dr. Rigg for having grappled with it. In spite of that gentleman's labours, neither the precise nature of the disease nor the best method of treatment could be said to be as yet definitely settled. He hoped that the discussion that evening might do something towards deciding some of the doubtful points connected with it. He would suggest that it would be well if members would take Mr. Tomes's brief and clear statement of his views as a model, and follow as much as possible the order of the questions on the papers which had been circulated among them. Dr. Field had lately exhibited Dr. Rigg's instruments before the Society, and had shown that he had had considerable experience in the treatment of this disease; he should be glad to hear if he could add anything to the observations he made on that occasion.

Dr. FIELD said he was glad to have the opportunity of stating that Dr. Rigg did not claim to be the discoverer of the disease which now bore his name, but only of a satisfactory method of treating it; and of the success of this treatment he (Dr. Field) had had ample proof. As to the origin and nature of the disease he thought that it was quite distinct from senile degeneration, and that in many cases it was not the result of any general disease, though it might be greatly aggravated by constitutional weakness or general malnutrition. He considered that it was a local disease, and that it was due to

neglect and uncleanness on the part of the patient. The success of Dr. Rigg's treatment confirmed this view. Quite recently a patient had come to him in a wretchedly low and weak condition, and with her teeth in such a state that a very severe course of treatment was necessary. Had the disease been the result of debility, one would have expected that the treatment would have increased this ; but, on the contrary, she quickly recovered her health, and out of twenty-six teeth all greatly diseased, all were saved except two. He had not yet met with a case in which no tartar was present, and he thought that, in cases when it appeared to be absent, a careful examination *between the teeth* would reveal its presence. In fact, he looked upon the accumulation of tartar as the starting-point of the disease : the deposit encroached on the gum, which receded ; irritation and inflammation was set up round the margin of the alveolus, and this finally led to necrosis. As to the treatment, he had explained this so fully on a former occasion that he felt it was unnecessary to repeat the details, but would only insist upon one point ; viz., that besides the removal of the tartar, it was most important, in order to obtain a successful result, to remove entirely the necrosed part of the alveolus.

The PRESIDENT said he was glad to see Dr. Coffin present ; as he knew he had given much attention to the subject, he hoped Dr. Coffin would give the Society the results of his experience. What was his opinion as to the origin of the disease ? Did he consider it local or constitutional ? Was it always due to neglect, or might it occur independently of this ?

Dr. COFFIN said he had not attended the meeting with any intention of taking part in the discussion, and would rather have remained a listener, still he would endeavour to answer the President's questions. Strictly speaking, the disease was local, and he treated it as such ; but its course might be materially influenced by the general condition of the patient. The primary cause was the presence of foreign matter about the teeth, though in some cases the local accumulation of tartar might be small. The next constant symptom was the

secretion of acid offensive mucus from the gums. As to the best method of treatment, it was simply that which common sense would suggest,—the removal of the tartar, the correction of the vitiated secretion by antiseptic applications, and by stimulating the blood-vessels about the necks of the teeth. The principal remedy he used was carbolic acid ; he applied this freely and persistently round the teeth under the edges of the gums, by means of a pointed stick of wood. The first effect of this was to cause a copious discharge of dark blood and matter, and it was also attended with a good deal of pain ; but after one or two applications very little pain was felt, and the discharge rapidly lessened. This should be repeated once or twice a week until the discharge ceased. After using the carbolic acid, he painted the gums freely with iodine. He found it better to apply the acid before attempting the removal of the tartar, as the sensitiveness of the gum was thus lessened, and the tartar could then be removed with less pain.

The PRESIDENT said he had been informed that certain tribes in India lost their teeth at an early age ; that these organs, though quite sound, dropped out at the age of forty-five. It had been ascribed to their constant use of soft food. Perhaps Mr. O'Meara could give them some information on this subject, and would tell them whether the loss of the teeth was attended by any symptoms which would throw any light upon the disease they were now discussing.

Mr. O'MEARA said it was a fact that, not in a certain tribe only, but all over India, men lost their teeth in this way. He could give no cause for it ; the men were healthy, tolerably cleanly in their habits, and their food was sufficiently varied. There was no apparent disease about the teeth, excepting the presence of tartar ; but in some cases even this was absent, and the disease consisted only of absorption of the alveolus and loss of the teeth : men began to lose their teeth at thirty, the lower incisors generally going first. It was curious that this was only the case in the plains of India ; in the hills the natives are more robust, but they are subject to dental caries.

Mr. RANGER said that though the effects of Rigg's disease and of senile atrophy were similar as regarded the loss of the teeth, he thought that they were distinct pathological processes. The former occurred generally in young subjects: he had lately been treating a young woman only twenty-three years of age. According to his experience, the first sign of the disease was an inflamed state of the gums; loose swollen tongues of gum were seen round the necks of the teeth, and there was a watery putrid-smelling discharge. Then the fangs began to be denuded and a nodular deposit of hard tartar could be seen surrounding the necks of the teeth; lastly, the disease attacked the margins of the alveoli. He agreed with Dr. Field that the primary cause was neglect, and that the tartar played a very important part in the destructive process; accumulation of tartar alone was sufficient to cause loosening of teeth in cases where the more acute symptoms of this disease were absent. The treatment he made use of, besides the removal of the tartar, was to apply round the teeth, by means of a brush, a mixture of Tinct. Catechu and Sp. Camphoræ; he also, in most cases, ordered the patient to take a mixture containing chlorate of potash, and to use dilute Condyl's fluid as a lotion for the mouth.

The PRESIDENT said the discussion had been interesting and instructive, though in the short time available it was impossible to arrive at any distinct conclusion; indeed, several interesting points connected with the disease had not even been touched upon. As to the nature of the disease, two views had been brought forward,—the local and the constitutional. He, himself, was inclined to the latter conclusion, for he had met with the disease in very cleanly people and had seen teeth come out, though quite free from tartar. He thought that the subjects of glandular struma were specially liable to this disease. Its starting-point seemed to be hyperæmia of the mucous membrane of the gum; but what produced this he could not say. Then, as to treatment, he could not say that he had found it as simple and satisfactory as might have been inferred from some of the accounts he had heard that evening;

indeed, in some cases he had tried in vain all the remedies he could think of. He thought that further investigations into the causes of the disease were required: if these could be satisfactorily cleared up, the proper treatment would follow as a matter of course.

The PRESIDENT said the Society would now adjourn until the first Monday in November. They had already several interesting papers promised for the concluding part of the session, and he hoped that members would reassemble for their discussion with renewed health after a pleasant vacation.

INDEX.

- ABSCCESS, alveolar, the radical cure of, 9.
- Absorbent papillæ, 133.
- Absorption, the process of in bone and tooth-structure, 129; review of authors who have written on the subject, *ib.*; definition, 130; its connection with the formation of bone, *ib.*; the changes in the dental alveoli, 131; the crypts, *ib.*; description of the histological appearances in absorption, *ib.*; Howship's lacunæ, 133; the absorbent papillæ, *ib.*; canaliculization, 134; pathological aspect of the subject, 136; the shedding of the temporary teeth, 141; absorption in the permanent set, a morbid process, 144; effects of non-absorption of temporary teeth, 147; arrest of the absorbing process, *ib.*; necrosed teeth, and the causes of their non-absorption, 148.
- Aconite and chloroform as a dressing, 13.
- Address of the President (Mr. Cartwright) on retirement, 49.
- Address, inaugural, of the President (Mr. Coleman), 65.
- Administration of gas and ether, new apparatus for, by Mr. Coleman, 78.
- Allen, Dr., inventor of the system of continuous gum-work, 2.
- Alveolar abscess, the radical cure of, 9; much remains to be learned on the subject, 10; extraction the most "radical" cure, 11; useful preservation of teeth, the limits of, 12; classification of cases, *ib.*; "gumboil," presence of, *ib.*; mode of operation, 13; aconite and chloroform as a dressing, *ib.*; necessity for thoroughness in cleaning out the fang, *ib.*; use of carbolic acid, 14; avoidance of water and glycerine, *ib.*; other preparations for filling, 15; conservative antiseptic dentistry, 16; authorities on the subject, *ib.*; conservation of the tooth by creosote and morphia, 17; arsenic as a permanent dressing, *ib.*; cases cited, 18; the pure carbolic acid treatment best adapted for the purpose, 19; diagnosis of the seat of, 20.
- Amalgam, Dr. Slayton's, 75.

Amalgam-carrier and plugger, new, by Mr. Stocken, 46.
 Amalgams, appointment of a committee to report on, 103.
 American Medical Association, donation to Library by, 2.
 American dentists and gold manipulations, 68.
 Anæsthetization, should be complete in operations, 83.
 Annealing lamp, new, by Dr. Field, 106.
 Annual General Meeting of the Society, 45.
 Apparatus for administration of gas and ether, new, 8.
 Arkövy, Dr., on the so-called Rigg's disease, 166.
 Aromatic sulphuric acid in alveolar abscess, 22, 23.
 Arsenic in alveolar abscess, 20; devitalization of the pulp produced by causing periodontitis, 103.
 Auditors, appointment of, 43.

B.

BALLOTING for members, conversation concerning, 160.
 Barrett, Mr. Ashley, on Symmetrical Extraction of Teeth, 33; case of extraction of a sixth-year molar, *ib.*; other analogous cases, *ib.*; a guide to treatment derived from them, *ib.*; objections replied to, 36; age of the patient, 37; the advance of teeth and its course, *ib.*; models illustrative of the subject, 38; reply to discussion, 42; on the proposed licences in Dental Surgery, 56; on the proposed new bye-law, 58; on the diagnosis of hysteria, 85;

on the treatment of exposed pulp, 101; on periodontitis resulting from devitalization of the pulp by arsenic, 103; on the expansion of the alveolar arch, 121; on the absorption of dead teeth, 154.
 Barrett, Mr. Henry, on the proposed licences in Dental Surgery, 56.
 Bell, Mr. Martin Luther (Canterbury), elected non-resident member, 1.
 Benham, Mr. George A. C. (Leeds), nominated for non-resident membership, 45; proposed for non-resident membership, 63; elected, 79.
 Benham, Mr. F. H., admitted to membership, 159.
 Bennett, the late Mr., observations by Mr. Cartwright on, 51.
 Bennett, Mr. Storer, elected resident member, 159.
 Bevers, Mr. H. A., admitted resident member, 2.
 Bloom, Mr. Mark J. (Dublin), nominated for non-resident membership, 25; elected, 63.
 Bone-work with natural teeth, 102.
 Brewster, Mr. (Cheltenham), contrives a new modification of Trill's vulcanite flask, 29.
 Bright, Mr. C. S. (Genoa), nominated for non-resident membership, 45; proposed, 63; elected, 79.
 Brookhouse, Mr. Robert, specimen by, illustrating Howship's lacunæ, 143.
 Browne, Mason M., exhibits specimen of geminated molar and wisdom tooth, 107.
 Brunton, Mr. George (Leeds), nomi-

nated for non-resident membership, 25; elected, 63.

Buck, Dr., of St. Petersburg, on the action of salicylic acid on the teeth, 162.

C.

CALCIFICATION, dentine, 87.

Canaliculization, 134.

Canton, Mr., on extraction for correction of dental irregularities, 121.

Carbolic acid in the radical cure of alveolar abscess, 19; application of to exposed pulp, 100.

Caries, the varied theories concerning, 70.

Cartwright, Mr. S., on symmetrical extraction, 39; precautions for preventing overcrowding, *ib.*; objections to the practice, *ib.*, 41; on the work of the Odontological Society during the previous year, 50; on the papers read, *ib.*; on deaths of members, 51; on the qualification for membership of the Society, 54; on the process of absorption, 155.

Catlin, Mr., on the treatment of dental irregularities, 120.

Cheoplastic process in continuous gum-work, 4.

Clasps, pain caused by, 46; how removable, 47.

Coffin, Dr., his appliance for expansion of the dental arch, 111; on the so-called Rigg's disease, 177.

Coleman, Mr., on Rogers's saliva-pump, 6; on arsenic as a cure for alveolar abscess, 20; on the position of the profession, and how influenced by the new Medical Act, 66; on the paucity of workers in Dental Anatomy and

Physiology, 66; on dental surgery, 67; the Dental Hospital, 68; dental degeneracy, 69; on dental pathology, 70; dental caries, *ib.*; irregularities, 70; on Dr. Slayton's new amalgam, 76; new apparatus by, for administration of gas and ether, 78; on hysterical mania and its treatment, 84; on the use of artificial light, 85; on the formation of dentine, 98, 100; on certain points in the treatment of dental irregularity, 109; on expansion of the dental arch as a mode of correcting irregularities, 109, 125; on treatment of dental irregularity, 119, 122, 123, 125; on the process of absorption, 151, 154, 155; on the teeth of gouty subjects, 165; on the treatment of the so-called Rigg's disease, 176, 179.

Coles, Mr. Oakley, on the prevention of overcrowding, 40; reply to, by Mr. Cartwright, 41; on the proposed new bye-law, 55; on the action of carbolic acid on the odontoblast cells, 100; on a specimen of "ozokerine," 161; on a modification of the clinical thermometer, 162; on elevation of temperature produced by inflammation, *ib.*; on the action of salicylic acid on the teeth, 162; on the teeth of gouty patients, 164; on the so-called Rigg's disease, 169.

Committee on Amalgams, appointment of, 103.

Communications read by Mr. Crapper, on Continuous Gum-work, 2; by Mr. Claude Rogers, on a new Saliva-pump, 6; from Mr. Dunn, on Dr. Slayton's Amalgam,

- 26 ; by Mr. Gaddes, on a case of Hysteria, 79 ; by Mr. Ashley Barrett, on Periodontitis, 103 ; from Mr. William Foster, respecting Slayton's Amalgam, 162 ; from Mr. Charles Tomes, on the so-called Rigg's disease, 165 ; from Dr. Arkövy, on the same subject, 166.
- Conservative antiseptic dentistry, 16.
- Continuous gum-work, *see* Gum-work, 2.
- Councillors, election of, 54.
- Coxeter's aspirator in alveolar abscess, 21.
- Crapper, Mr., on continuous Gum-work, 2.
- Curator of the Society's Museum, election of, 54 ; vote of thanks to the, 53.
- D.
- DABOLL, Mr. G. C. (New York), elected non-resident member, 159.
- Deaths of members, 61.
- Deciduous teeth, desirability of preserving, 21 ; Dr. Slayton's stopping for, 26.
- Dennant, Mr., on the proposed new bye-law, 58 ; on the process of absorption, 156.
- Dental anatomy and physiology, paucity of workers in, 66.
- Dental degeneracy, 69.
- Dental surgery still incommensurate, 67 ; vastly improved in last few years, 68.
- Dentigerous cysts, case illustrative of the pathology of, 7.
- Dentinal fibrils, calcification of, 96.
- Dentine calcification, 87 ; how healthy dentine is built up, 88 ; development of typical vaso-dentine, *ib.* ; plici-dentine, 90 ; osteo-dentine, *ib.* ; globular masses of dentine, 91 ; odontomes, 92 ; normal odontoblast calcification, 94 ; calcification of the dentinal fibrils, 96.
- Devitalizing, alleged action of arsenic in, 21.
- Diagnosis of the seat of alveolar abscess, 20.
- Diploma, dental, as a qualification for membership of the Society, 54 ; discussion on, *ib.*
- Discussions : on the conservative treatment of alveolar abscess, 20 ; on the symmetrical extraction of teeth, 39 ; on the proposed dental diploma, 54 ; on some forms of dentine calcification, 98 ; on treatment of dental irregularity, 119 ; on the process of absorption in bone and tooth-structure, 151 ; on the so-called Rigg's disease, 176.
- Donations to Library : by Mr. F. Mason, of his work on "Harelip and Cleft Palate," 2 ; by M. Magitot, of his work, "Traité des Anomalies du Système Dentaire," *ib.* ; "Transactions of American Medical Association during 1876," Prize Essays of same society, *ib.*
- Donations to Museum by Mr. Mummery, of the skeleton of an elephant's head, 25 ; by Mr. Richardson, of ossified roots, 106 ; by Mr. E. B. West, of an antique extracting instrument, 127 ; by Mr. Rutterford, of a cast of the jaw of an aged negress, 160 ; by Mr. O'Meara, of the head of a young alligator, 161.

Dressing, aconite and chloroform, 13.

Dunn, Mr. (Florence), on Dr. Slayton's new metallic stopping, 26.

E.

ELECTION of officers and Council, 54.

Elephant tusks, the secondary dentine of, 76.

Ether, new apparatus for administration of, 8.

Expansion of the dental arch *vice* extraction, 109.

Exposed pulp, treatment of, 101.

Extraction, symmetrical, 33; for the correction of irregularities, Dr. Field on, 119; Mr. Canton on, 121; can the absence of teeth be transmitted hereditarily? 124.

Extraction *vice* expansion of the dental arch, 109.

F.

FAIRBANK, Mr., appointed auditor of treasurer's accounts, 43.

Fergusson, the late Sir William, Mr. Cartwright on, 51.

Field, Dr., on replantation, 21; on the preservation of the deciduous teeth, *ib.*; on the use of artificial light, 86; on the aspect of a working-room, *ib.*; on the application of carbolic acid to exposed pulp, 100; instruments for use in Rigg's disease, *by*, 105; new annealing-lamp *by*, 106; on the correction of irregularity, 119, 123; on the so-called Rigg's disease, 176.

Finances, statement of, 60.

Foran, Mr. J. C. (Eastbourne), nominated non-resident member, 127.

Forceps, new, for extraction of upper molar stumps, 29.

Foster, Mr. Wm., report on Slayton's amalgam *by*, 163.

Fox, Mr. Ch. J., on irregularities, 73; on the mouth of a native of Venezuela, 106; on a geminated molar and wisdom tooth, 107.

Fracture of an incisor, 73; treatment of, 74.

G.

GADDES, Mr., on the "conjoint scheme," 57; on the new bye-law, 58; on the danger of semi-anæsthetization, 83; on the formation of dentine, 98; on mechanical expansion of the dental arch, 125; on the process of absorption, 154.

Garland, Mr. T. G. T. (Exeter), elected non-resident member, 159.

Garner, Mr. J. R., on a case of hysteria, 79.

Gas, new apparatus for administration of, 8.

Gibbings, Mr. Ashley, on the proposed new bye-law, 56.

Globular calcification, 92.

Gold, its use at the Dental Hospital, 68; probable substitution of other material, 69.

Gout, its effects upon the teeth, 163.

Gum-work, continuous, Mr. Crapper on, 2; origin of the system, *ib.*; its objections, *ib.*; objection to sharply defined edges of suction-plates, 3; necessity of patients taking care of teeth when not in mouth, *ib.*; a wooden bowl desir-

able for washing teeth in, *ib.*; necessity for making the plate a perfect fit, *ib.*; mode of constructing, *ib.*; the cheoplastic process, 4; described in Dr. Harris's work on the "Principles of Dentistry," 5.

H.

- HARDING, Mr. Geo. Hilditch, on the process of absorption in bone and tooth-structure, 129, 156.
 Harris, Dr., on the cheoplastic process, 5.
 Henry, Mr., appointed scrutator of the ballot, 47.
 Hepburn, Mr., specimen of bone-work with natural teeth, 102.
 Hockley, Mr. Geo., nominated resident member, 127.
 Honorary secretaries, election of,
 Howarth, Mr., exhibits a new lathe head, 8.
 Howe's scalers superseded by Rigg's instrument, 105.
 Howship's lacunæ, 133.
 Hunt, Mr., on symmetrical extraction, 41.
 Hutchinson, Mr. S. J., on the radical cure of alveolar abscess, 9; reply to discussion on the radical cure of alveolar abscess, 22; on aromatic sulphuric acid, 23; on symmetrical extraction, 41; on Dr. Slayton's new amalgam, 76; on the use of artificial light, 85; on mechanical expansion of the dental arch, 124; on the merits of Kirby's pneumatic hammer, 128; on the process of absorption, 151, 153; appointed auditor of treasurer's accounts, 43.
 Hysteria, case of, with unusual symptoms, 79.

I.

ILLUSTRATION of a saliva-pump, 6.

Illustrations: of a tooth composed of vaso-dentine, 89; section of vaso-dentine, *ib.*; section of an osteo-dentine tooth, 91; of a case of ossified roots, 106; Dr. Coffin's appliance for expansion of the dental arch, 112; of abnormal approximation of the bicuspid and molars, 113; of upper lateral incisors bitten over by the cuspidate of the lower jaw, 114; of the same after treatment of the irregularity, 115; of a case of dental irregularity, and the result of treatment, 117.

Irregularities, treatment of, remarks by Mr. Coleman, 70; paper by Mr. Coleman, 109; the maxillæ of diminished size in civilized generations, *ib.*; two systems dealt with, 110; making the jaws harmonize with the teeth, 111; making the teeth harmonize with the jaws, *ib.*; advantages of the former method, *ib.*; Dr. Coffin's appliance, *ib.*; illustration of, 112; improvement in, by Dr. Kingsley, *ib.*; adaptation of the teeth to the maxillæ, 113; comparative advantages of the two methods of treatment, 114; case illustrative of the preceding, 115; treatment of prominent front teeth, 116; advantages of dispensing with mechanical aids, 118; conclusion, *ib.*

K.

KEELING, Mr. E. R., Jun., admitted member, 2.

King, Mr. C. Norman (Exeter), nominated for non-resident membership, 25; elected, 63.

King, Mr. Henry Augustus (Exeter), nominated for non-resident membership, 25; elected, 63.

Kingsley, Dr., improvement on Dr. Coffin's appliance for correcting irregularity, 112.

Kirby's pneumatic hammer, modification of by Mr. Chas. Tomes, 128.

L.

LAMP for artificial light, new, by Mr. Rogers, 85.

Lathe head, new, exhibited by Mr. Howarth, 8.

Laws, Mr. John (Bolton), nominated for non-resident membership, 45; proposed for membership, 63; elected, 79; admitted, 159.

Laycock, Dr. (Edinburgh), on the teeth of gouty subjects, 164.

Levason, Mr. (Hereford), elected non-resident member, 1.

Librarian, vote of thanks to the, 53; election of, 54.

Library: Report of the Librarian (Mr. Thos. A. Rogers), 47; donations to: by Mr. Francis Mason, 2; by M. Magitot, *ib.*; by the American Medical Association, *ib.*

Licences in Dental Surgery, proposed in Parliament, 55.

Light, a southern aspect best, 86.

Longhurst, Mr. Bell, on a singular paper pad in a misfitting dentine, 46.

Lyons, Mr., appointed scrutator of the ballot, 47.

M.

MAGITOT, M.E. (Paris), donation to

Library by, 2; nominated for corresponding membership, 1; elected, 45.

Mason, Mr. Francis, donation to Library by, 2.

Medical corporations and licences in dental surgery, 55.

Meetings of the Society, annual, 45; monthly general, 1, 25, 63, 79, 103, 127, 159.

Members, deaths of, 61; elected during the year, statement of, 61; new, nominated and elected, *ib.*

Merson, Mr., on mechanical correction of irregularity, 124; elected resident member, 159.

Moon, Mr., on Mr. Tomes's radicular odontome, 30; on prevention of overcrowding, 42; on a case of fracture, 76; on the expansion method of correcting irregularities, 122.

Moore, Mr., relation of a case illustrative of the pathology of denticulous cysts, 7.

Moore, Mr. (of Plymouth), on exostoses in teeth subject to alveolar abscess, 22; his treatment of alveolar abscess, *ib.*

Morris, Mr. (Chester), a lobulated fibroid tumour on a molar, sent for exhibition by, 127.

Mummery, Mr., on symmetrical extraction, 39; on premature extraction, *ib.*; on relief of overcrowding, 40; donation to Museum of skeleton of elephant's head, 25.

Murphy, Mr. Thos. (Bolton), nominated for non-resident membership, 25; elected, 63.

Museum, donations to: of the skeleton of an elephant's head, 25;

of ossified roots, 106; of an antique extracting instrument, 128; of a cast of the jaw of an aged negress, 160; of the head of a young alligator, 161.

Museum: report of the curator (Mr. Charles S. Tomes), 47.

N.

New members elected, statement of, 61.

New members, mode of election, conversation on, 160.

Nitric acid, application of to exposed pulps, 102.

O.

ODONTOME, radicular, case of, narrated by Mr. Moon, 30.

Odontomes, 92.

Officers and Council, election of, 54.

O'Meara, Mr. (Simla), donation to Museum by, 161; on the loss of teeth among native Indians, 178.

Osteo-dentine, development of, 90.

Overcrowding, Mr. Cartwright on measures to prevent, 39; Mr. Mummery, *ib.*; Mr. Coles on, 40; Mr. Hutchinson on, 41; Mr. Moon on, 42.

Ozokerine (Messrs. Field's), a new product of petroleum, 161.

P.

PAD of paper in a misfitting dentine, 46.

Palmer, Mr. (Cheltenham), new vulcanite flask by, 29.

Papers read: by Mr. S. J. Hutchinson, 9; by Mr. Ashley Barrett, 33; by Mr. C. S. Tomes, 87; by Mr. Coleman, 109; by Mr. G. H.

Harding, 129; by Mr. Oakley Coles, 169.

Pasmore, Mr. George Frederick (Exeter), nominated for non-resident membership, 1; elected, 45.

Payne, Mr. E. T. (Southampton), proposed for non-resident membership, 79; elected, 103.

Pedley, Dr. Thos. F., nominated for resident membership, 25; elected, 63; admitted, 159.

Pedley, Mr., on a new apparatus by, for administration of gas and ether, 8; on a form of regulating plate, 161.

Periodontitis resulting from devitalization of the pulp by arsenic, 103.

Phillips, Mr., model by, of the mouth of a native of Venezuela, 106.

Plici-dentine, development of, 90.

Position of Odontological Society, 60.

Poundall, Dr. Wm. Lloyd (Brighton), nominated for non-resident membership, 25.

President, election of, 54.

President's address, 49.

President's opening address, 65.

Pulp, devitalizing by arsenic, 21.

Pump, saliva, exhibited by Mr. Claude Rogers, 6, 45.

R.

RANGER, Mr. W. G., on a lobulated fibroid tumour on a wisdom tooth, 128; specimen illustrating Howship's lacunæ, 143; on the process of absorption, 153; on the so-called Rigg's disease, 179.

Read, Mr., on a fracture of an incisor and its treatment, 73;

on specimens of twin teeth, 73;
on Dr. Slayton's amalgam, 75.
Regulating plate, as used by Mr.
Pedley, 161; new, contrived by
Mr. J. S. Turner, 161.
Replantation in alveolar abscess, 21.
Resignations of members, 61.
Richardson, Mr., presentation of
specimen of ossified roots by, 106.
Rigg's disease, so-called, its nature
and treatment, 165; views of
Mr. Charles Tomes, *ib.*; of Dr.
Arkövy, 166; of Mr. Oakley
Coles, 169; inconvenience of
personal nomenclature, *ib.*; re-
cession of the gum, 171; a con-
dition to be classed with the
"diseases of modern life," *ib.*;
doubtless due to impaired local
nutrition, 172; deposition of the
tartar, 173; atrophy of the
periosteum of the fang of the
tooth, 175.
Rigg's disease, new instruments
for, by Dr. Field, 105.
Robertson, Mr. Andrew (Hereford),
nominated for non-resident mem-
bership, 1; elected, 45.
Rogers, Mr. Claude, saliva-pump
by, 6; on a new saliva-pump,
45; on a tongue-shield, 46; new
lamp by, 85; elected resident
member, 1; admitted, 25.
Rogers, Mr. Thomas, on a case of
fracture, 75; on the formation
of dentine, 78; on the condition
of the Society's Library, 47; on
the proposed new bye-law, 57.
Rutterford, Mr., donation to
Museum by, 160.

S.

SALICYLIC acid, its action on the
teeth, 162.

Saliva-pump, exhibited by Mr.
Claude Rogers, 6.
Scrutators of the ballot, appoint-
ment of, 47.
Secretaries, honorary, election of,
54.
Secretaries, vote of thanks to the,
53.
Sewill, Mr. Henry, on mechanical
treatment of dental irregulari-
ties, 121; on the teeth in the
diagnosis of gout, 163.
Shield for tongue, new, by Mr.
Rogers, 46.
Simmonds, Mr. Jos. J., admitted
member, 2.
Slayton's, Dr., new metallic stop-
ping, 26; case treated with by
Mr. Read, 74; analysis of, 163.
Smith, Mr. W. Taylor, admitted
member, 2.
Special meeting of the Society, 54.
Stewart, Dr., on the teeth of gouty
subjects, 164.
Stocken, Mr., on the constitution
of the patient in alveolar abscess,
22; new amalgam-carrier and
plugger, by, 46.
Stopping, Dr. Slayton's new
metallic, 26; analysis of, 163.
Swallowing artificial teeth, case of,
28.
Symmetrical extraction of teeth, 33.

T.

TEETH: alveolar abscess, 9; its
radical cure, *ib.*; the limits of
useful preservation of the teeth,
11; classification of cases, *ib.*;
aconite and chloroform as a
dressing for, 13; necessity for
thoroughness in cleaning out the
fang, *ib.*; use of carbolic acid,

14; avoidance of water and glycerine, *ib.*; other preparations for filling, 15; conservative antiseptic dentistry, 16; authorities on the subject, *ib.*; conservation of the tooth by creosote and morphia, 17; arsenic as a permanent dressing, *ib.*; cases cited, 18; pure carbolic acid treatment best adapted for the purpose, 19; diagnosis of the seat of alveolar abscess, 20; Dr. Slayton's new metal for filling teeth, 26; a fatal case of teeth swallowing, 28; the symmetrical extraction of teeth, 33; case of fracture of the right upper central incisor treated in a novel manner, 72; specimens of turn teeth, 73; balls of secondary dentine from the tusk socket of an elephant, 77; dentine calcification, 87; how healthy dentine is built up, 88; development of typical vaso-dentine, *ib.*; plicidentine, 90; osteo-dentine, *ib.*; globular masses of dentine, 91; odontomes, 92; normal odontoblast calcification, 94; calcification of the dentinal fibrils, 96; periodontitis resulting from dentalisation of the pulp by arsenic, 103; upper molar with roots coated with a thin layer of bone, 106; teeth of a native of Venezuela, *ib.*; dental irregularities, extraction *vice* expansion of the dental arch, 109; making the jaws harmonize with the teeth, 111; making the teeth harmonize with the jaws, *ib.*; Dr. Coffin's appliance, *ib.*; treatment of prominent front teeth, 116; advantages of dis-

persing with mechanical aids, 118; the process of absorption in bone and tooth structure, 129; definition, 130; changes in the dental alveoli, 131; Howship's lacunæ, 133; canaliculization, 134; pathological aspect of the subject, 136; shedding of temporary teeth, 141; absorption in the permanent set a morbid process, 144; effects of non-absorption of temporary teeth, 147; necrosed teeth and the causes of their absorption, 148; teeth of gouty patients, 163; the nature and treatment of Rigg's disease, so-called, 165, 169; one of the "diseases of modern life," 171; doubtless due to impaired local nutrition, 172; deposition of the tartar, 173; atrophy of the periosteum of the fang of the tooth, 175.

Tomes, Mr. Charles, on Rogers's saliva-pump, 6; on a lobulated calcified tumour attached to a lower molar, 7; on an elephant's tusk, 7; on the treatment of alveolar abscess, 22; on inflammation of the soft parts, *ib.*; on a vulcanite flask by Mr. Palmer, 29; on forceps for the extraction of upper molar stumps, *ib.*; on an improved tongue-holder invented by himself, 29; on the proposed new bye-law, 56; on the secondary dentine of an elephant, 76; on some forms of dentine calcification, 87; on calcification of the pulp, 102; on the pathology of Rigg's disease, 105; on a specimen of ossified roots, 106; on correction of dental irregularity, 122; ex-

hibition by, of misplaced or supernumerary canine, 127; of a lobulated fibroid tumour on a molar, *ib.*; of an antique extracting instrument, 127; modification of Kirby's pneumatic hammer, 128; on the process of absorption, 152, 153; on the nature and treatment of Rigg's disease, so-called, 165; elected a fellow of the Royal Society, 127.
 Tongue-holder, new, invented by Mr. Tomes, 29.
 Treasurer's financial statement, 60
 Treasurer, vote of thanks to the, 53
 Treatment of dental irregularity, 109.
 Trill's flask, a modification of by Mr. Palmer, of Cheltenham, 29.
 Turner, Mr. J. S., on the proposed new bye-law, 58; new regulating-plate by, 161.
 Twin teeth, specimen of, 73.

U.

UNDERWOOD, Mr., on the president, 53; on qualification for the membership of the Society, 55; on the mode of balloting for members, 159.

V.

VANDERPANT, Mr., on arsenic in the treatment of alveolar abscess, 20; on pain caused by clasps, 46; on an irregularity, 73; on hysterical mania supervening after

the administration of gas, 86; on the correction of dental irregularities, 122.

Vasey, Mr. Charles, on qualification for membership of the Society, 55; on the proposed dental licences, 58.

Vaso-dentine, development of 88.

Venezuela native, mouth of a, 106.

Vice-presidents, election of, 54.

Vote of thanks to the retiring President, 53.

W.

WEISS, Mr., on a case of artificial teeth swallowing, 28.

West, Mr. E. B., presentation to Museum of antique extracting instrument, 128.

West, Mr. Wm., nominated resident member, 127.

White, Mr., on calcification of the pulp a cause of pain, 99; carbolic acid on the odontoblasts, 99.

Woodburn, Dr. J. Cowan (Glasgow), nominated for non-resident membership, 25; elected, 63.

Woodhouse, Mr. Alfred, on continuous gum-work, 5; on the radical cure of alveolar abscess, 20; on the regulating plate, 161; on the teeth of gouty patients, 164.

Woods, Mr. W. T. (Calcutta), proposed for non-resident membership, 159.

Worster, Mr. Josiah W., nominated resident member, 127.



INDEX TO PLATES.

PLATE I. Process of absorption in bone and tooth-structure.

Fig. 1. Longitudinal section of a human molar tooth, showing the granular layer of Tomes, broken by the action of absorption.

Fig. 2. Transverse section of the fang of the molar tooth of a rhinoceros, showing the interruption of Tomes's granular layer.

PLATE II. Fig. 3. Transverse section of a horse's tooth, showing excavations, the circular bays being occupied by bone lacunæ.

